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# The Broomell Vapor System:

## WHAT IT IS.

*vapor heating* *Heating*

The Vapor System is the evolution of heating by steam and by hot water; it is the higher development—the elimination of all that is defective, and the combining and perfecting of all that is good and desirable, of both these systems.

Take, for example, the element of The Vapor System by which all heating is done—the Vapor:\* it is neither steam nor hot water, but just between, and better than either, as can be readily and satisfactorily demonstrated.

The Vapor System has the widest range of usefulness, being adaptable to structures of every class, from the coziest cottage to the greatest auditorium, from the most barnlike factory to the tallest skyscraper.

\* "Vapor," it should be understood, as used relative to The Vapor System, means the vapor from *boiling water not under pressure*.

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## VAPOR HEATING COMPANY

General Offices: 917 Arch Street

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JOHN T. PALMER COMPANY  
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# The Broomell Vapor System :

## ITS DISTINCTIVE PARTS.

The patented features of The Vapor System, which are exclusively manufactured by The Vapor Heating Company, consist of :

The combined Receiver, Draft-regulator, Expansion Gauge and Relief-Valve. Which is attached to the boiler and regulates the fire.

The Quintuple Radiator-Valve. Which controls the flow of vapor into the radiators, and regulates the amount of heat.

The Special Union Elbow. Attached to the outlet of each radiator.

Particular attention is directed to the detailed descriptions of these parts, on the pages following.

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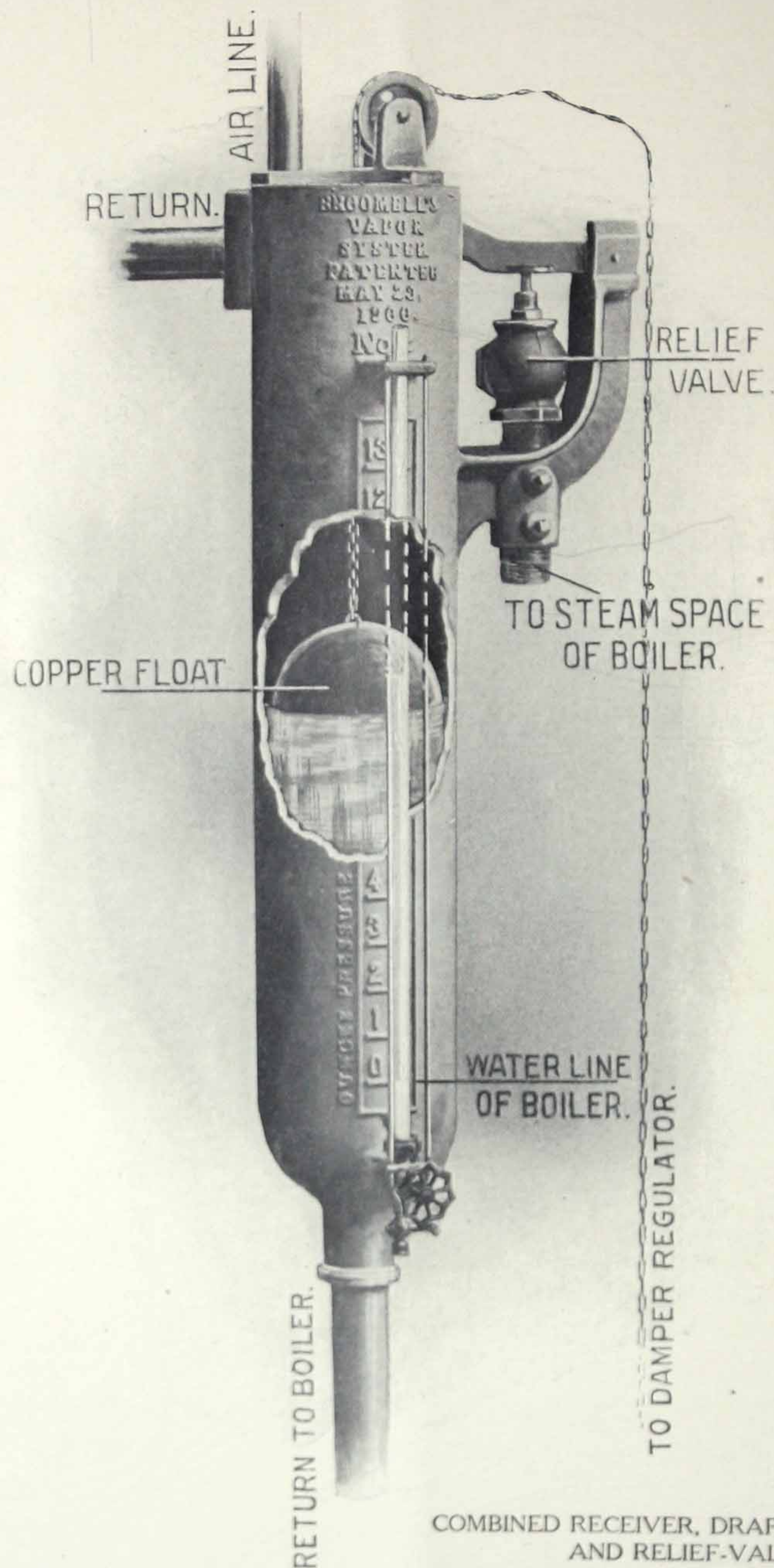
### BOILERS, PIPING AND RADIATORS

are not made by The Vapor Heating Company. The company has no interest in any particular make. Any steam boiler, of standard ratings, may be used. The radiators required are the standard hot-water pattern, with  $\frac{3}{4}$ -inch inlet at top and  $\frac{1}{2}$ -inch outlet at bottom. The piping is also standard, but smaller than that required by steam and hot-water systems.

VAPOR HEATING COMPANY, PHILADELPHIA.



# The Vapor System



COMBINED RECEIVER, DRAFT-REGULATOR  
AND RELIEF-VALVE.

The gauge glass on front of receiver indicates ounces of vapor in boiler. The spun-copper float on water connects by a brass chain to draft-door and chimney-check. The relief-valve is controlled by a lever extending into receiver; it is released when lever is raised by float, as a result of the expansion of the water.

For boiler connections, see page 16.

VAPOR HEATING COMPANY, PHILADELPHIA.



# The Vapor System :

## THE RECEIVER.

The combined receiver, draft-regulator and relief-valve governs the operation of The Vapor System. Its details are shown in the illustration. It is reliable because of its simplicity—no complicated mechanism, nothing to get out of gear. It can be depended upon to close boiler-draft and open chimney-check at any set point, ranging from zero to fourteen ounces.

The receiver is placed at side of the boiler, so that the zero mark on receiver and the water-line of boiler shall be on same level. The bottom outlet of receiver is connected directly into main return inlet of boiler.

The main return of the system is connected into a seal at back of receiver at top. All condensation is delivered into this seal, and is returned to boiler by gravity, through the open receiver, which is connected to return inlet of boiler, as above described.

An air-line is taken off the top of seal, where condensation is delivered, and run to the chimney, passing through Condensing Coil, thereby eliminating any possibility of moisture entering the chimney.

The relief-valve is connected to the steam space of boiler.\*

When radiators are fully heated, the float in receiver operates the boiler drafts, and regulates the fire to generate just sufficient vapor to fill the system. The operation of drafts is simple: Expansion of the water in boiler beyond the point necessary to keep the system filled with vapor results in elevating the surface of the water in receiver. This raises the draft-regulating float, and checks the fire. When radiator-valves are partially closed, reducing the flow of vapor into the radiators, the draft-regulating float operates in the same manner, and the fire is regulated to produce just enough vapor to fill the amount of radiation turned on. This is a practical demonstration of the economy of The Vapor System.

The relief-valve is provided to prevent any possibility of high pressure. If by neglect the ash-pit door should be left open, thus nullifying the automatic draft regulation, the water will continue to rise in receiver, carrying with it the float, which has already closed the draft; the float will presently lift the lever, releasing the relief-valve. The water immediately drops in receiver. When it gets below the point where float was set, the draft-door will be operated in usual way.

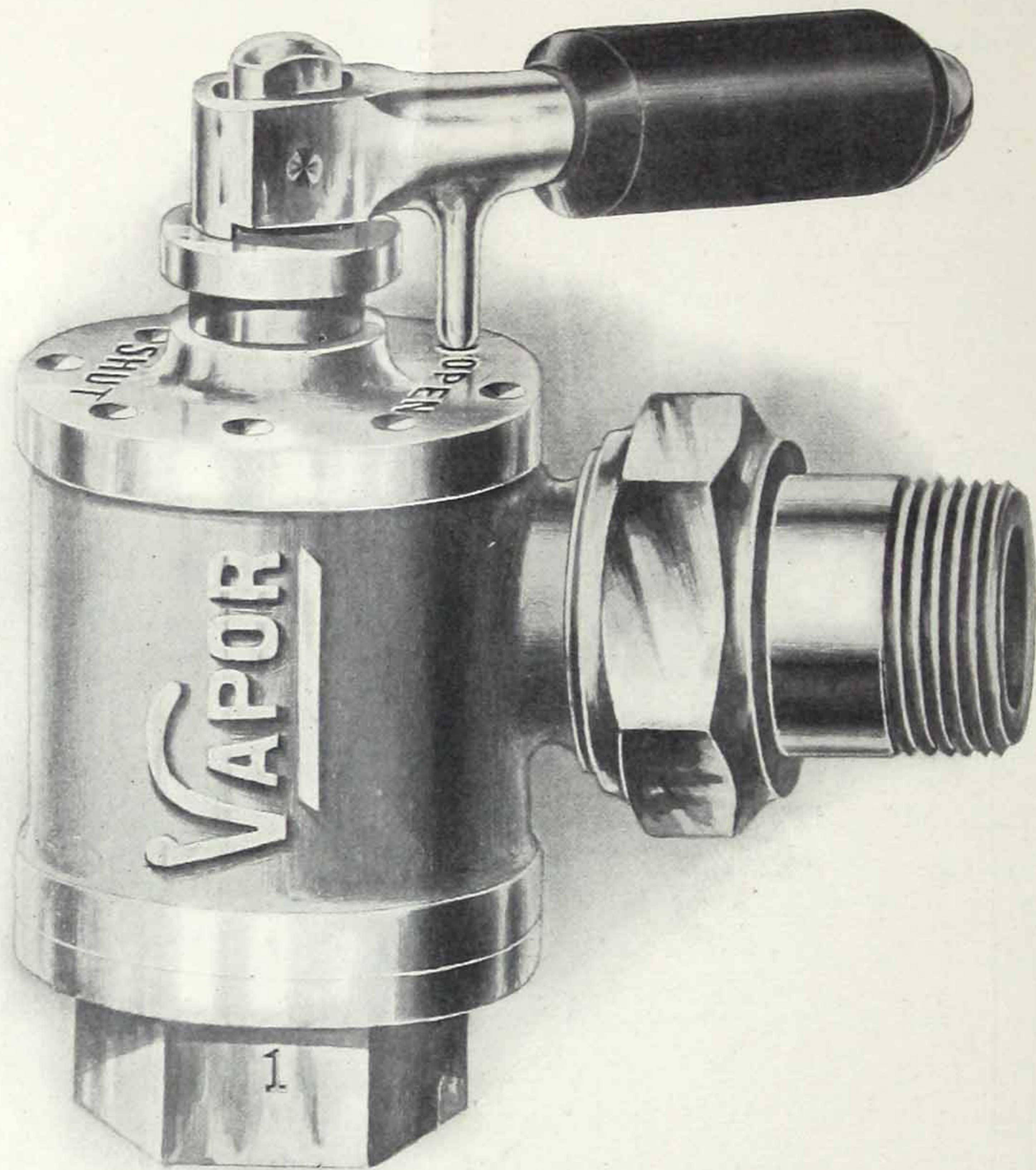
The great advantage of this receiver is that it can be set to close the draft at any point between zero and 14 ounces. In moderate weather, it is sometimes desirable to close the damper on one or two ounces pressure. In colder weather, float can be set to close the draft at four to six ounces, as may be required. Only sufficient boiler pressure to operate the drafts is required by The Vapor System.

*Fire-door and ash-pit-door are kept closed and boiler is regulated entirely by the Receiver.*

\*See illustration of boiler connections, page 16.



# The Vapor System



THE QUINTUPLE RADIATOR VALVE.

Position of handle indicates that  
valve is three-quarters open.

VAPOR HEATING COMPANY, PHILADELPHIA



# The Vapor System:

## ITS DISTINCTIVE RADIATOR VALVE.

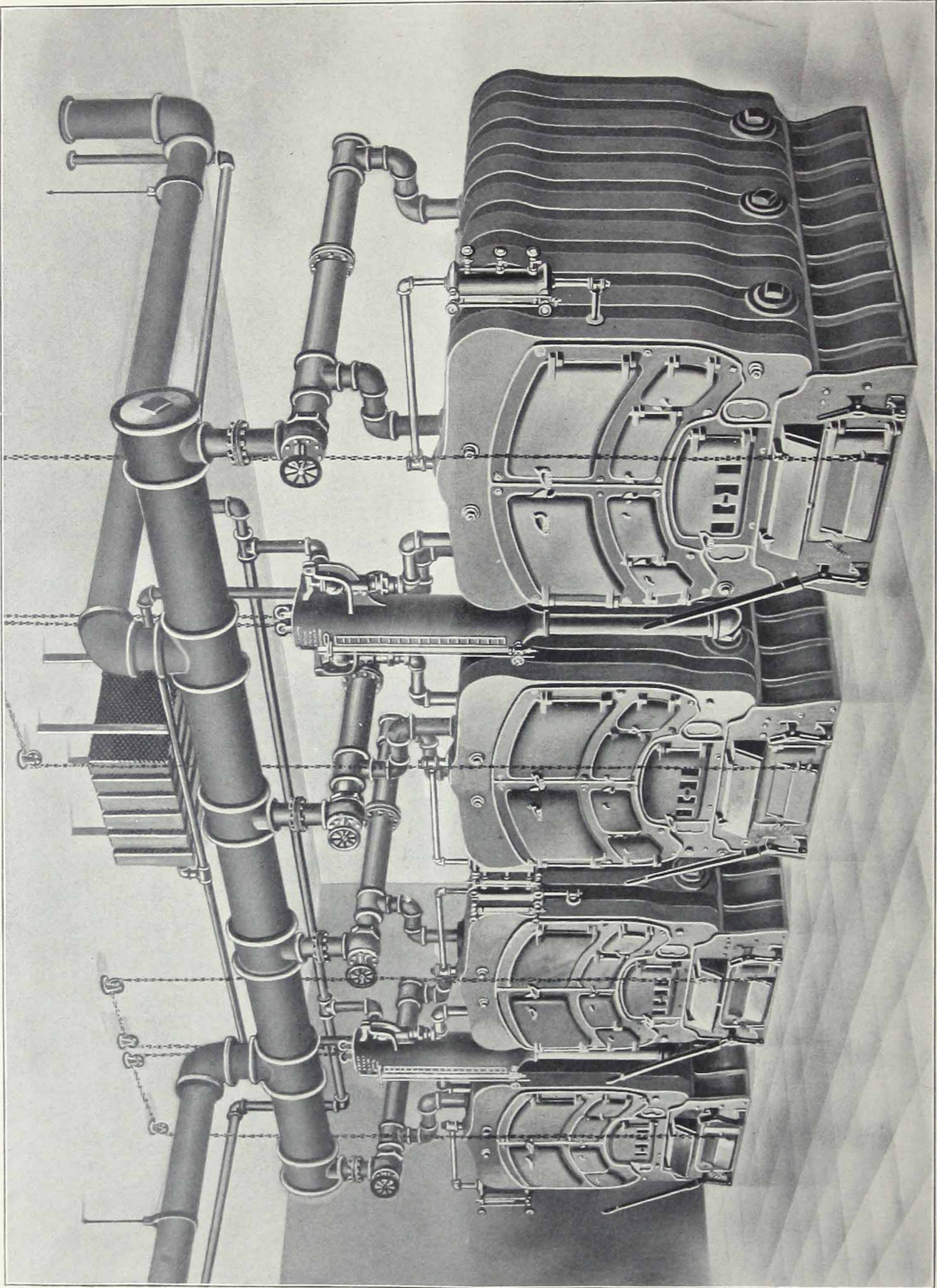
The Quintuple Valve regulates the temperature of the radiators. It is the only radiator-valve with which such regulation is possible. It can be instantly and easily set to admit more or less vapor; to partially heat the radiator; to heat it a little more; to heat it much more; and, finally, to bring the radiator up to the maximum temperature.

This, of course, means that the Quintuple Valve differs altogether from the ordinary radiator-throttle. Experts pronounce it the most perfect valve for the purpose that can be designed. Aside from being an excellent example of mechanism, it is handsomely finished. Very heavy and substantial, the finished parts all nickel plated, highly polished. The handle finished in ebony. It is perfectly steam tight, is self packing in the valve stem, and can be set with the thumb and finger. When the valve is connected up, the supply pipe is screwed into the bottom, and the nipple of the valve is screwed into the radiator.

To deliver Vapor to the radiator the handle is moved around one point; this opens a port on the valve-disc. If more heat is wanted the handle is moved to the next point. Still another move gives a three-fourths opening, as in illustration. To give the valve full opening, the handle is turned half around until it stands towards the radiator in such position that four holes in disc of valve match the four holes in body of valve.

Quintuple Valves are in six sizes, for three-fourths inch pipe: 02, 03, No. 1, No. 2, No. 3, No. 4, No. 5, No. 6. These valves are so made as to deliver the quantity of Vapor necessary to heat the radiators on which they are placed. In other words, the size of the openings in valve corresponds to the size of radiator.





BOILER SETTING—CENTRAL PLANT, BROOMELL VAPOR SYSTEM.



## CONNECTIONS TO BOILER

are made as shown in illustration. It should be understood that The Vapor System does not require a special design of boiler. Any standard-rating boiler may be used with this receiver; the requirements are simply a low water line, and placing of receiver with zero at level of water line of boiler.

The Vapor System also operates satisfactorily with steam from street mains; a special receiver is used for this purpose. And the system works advantageously from high-pressure boilers with a proper reducing pressure valve. Also from exhaust steam.

## THE CONDENSING COIL

will be observed above the boiler, and connected to receiver.

From the top of the condensing coil, on opposite end from connection to receiver, an air-line is run into the chimney. This creates a pull, and a partial vacuum, through the entire system, equal to the draft of the chimney, exhausting the air from radiators and pulling the vapor into them as soon as the valves are opened.

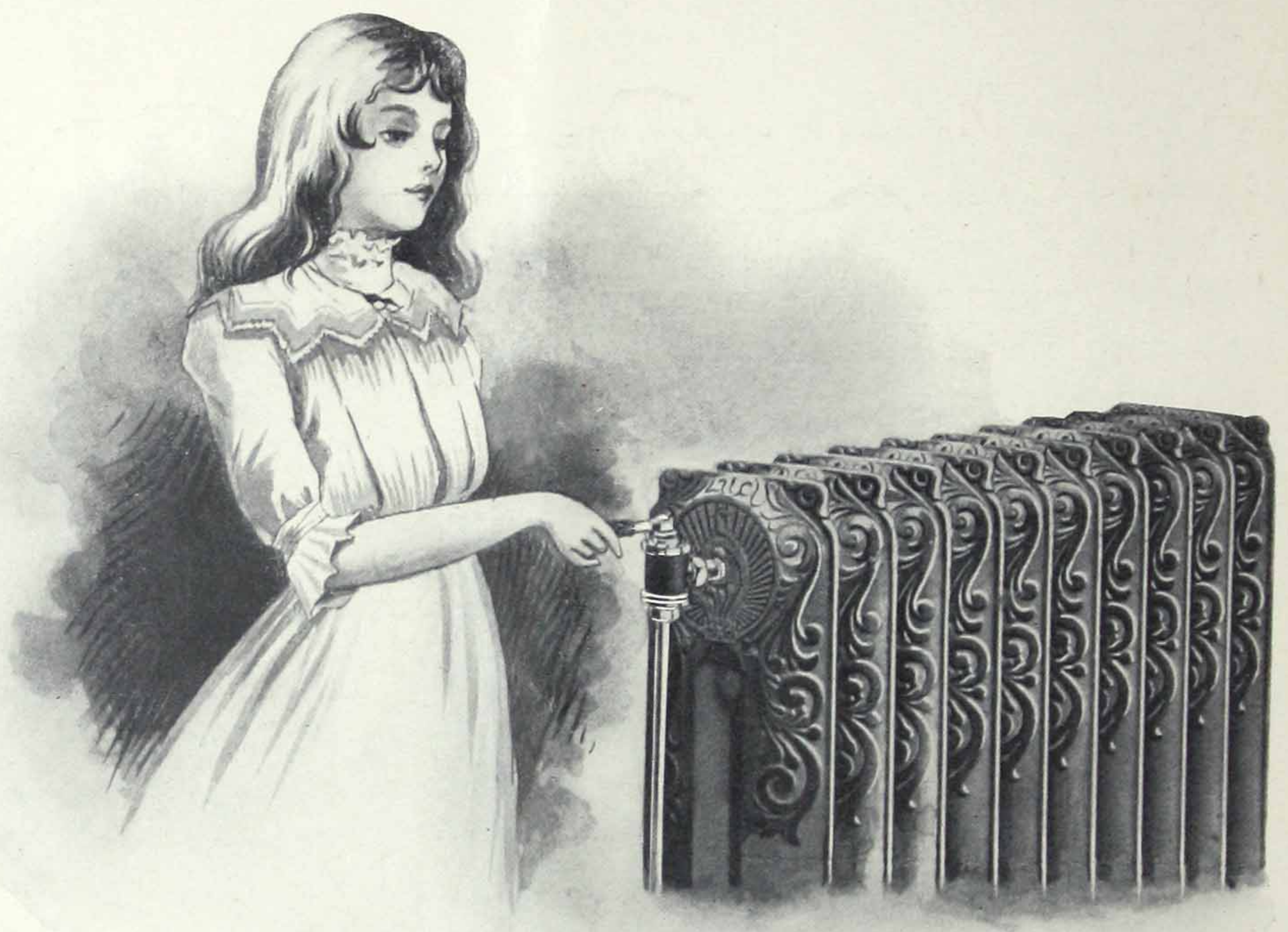


UNION ELBOW RETURN.

The return end of all radiators must be connected to the return pipes by Broomell's Improved Union Elbow. This elbow is of special design, and is so constructed that condensation is freely discharged from the radiators through seal in elbow, the air being exhausted through outlet above seal. From this point air and condensation are taken back in main return pipe to seal at top of receiver.

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# The Vapor System:

## HOW IT WORKS.

All mechanical advancement is marked by progression from complex to simple forms and devices. A thing made better by improvement is also made simpler. As The Vapor System is an improvement on all other heating systems, so is it simpler than all other heating systems. Readily installed, it is free of intricacies, easily managed and safe. Furthermore, The Vapor System gives results: quick heat and plenty of it, when you want it and how you want it.

If The Vapor System were to be described in two words, those two words would be—just heat. No pressure nor water in pipes and radiators; no air-valves; no noise; no bother and worry—*just heat!* And heat in a very familiar form—simply the vapor which arises from hot water.

## THE OPERATION AND SELF-REGULATION

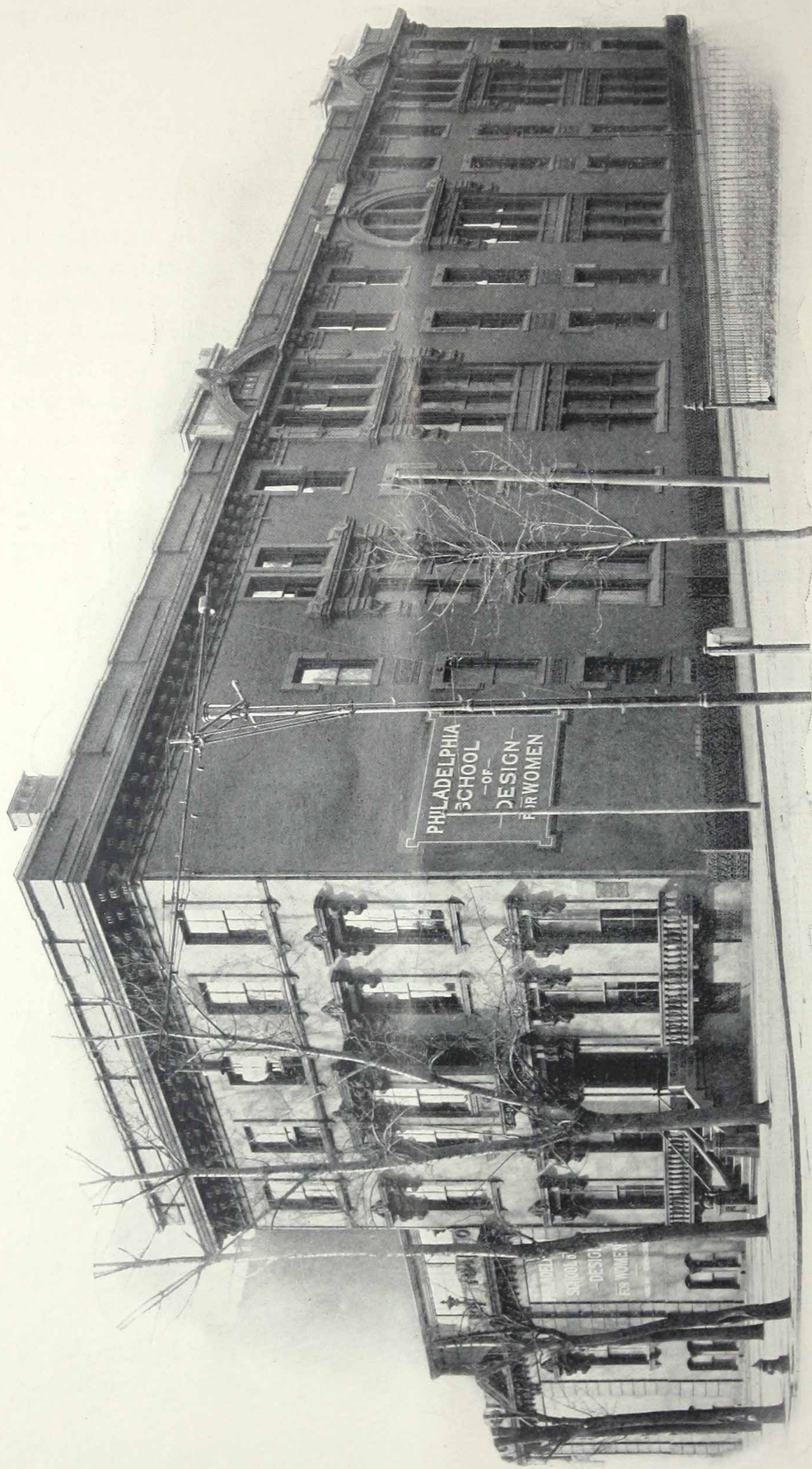
of The Vapor System will be understood by considering the descriptions of Receiver, Quintuple Valve and boiler connections along with this explanation:

The boiler (a standard steam type) is filled to the proper level with water. A fire is started. Soon the water begins to vaporize. The Vapor ascends in the supply pipes and enters the radiators; it does so in a natural way; not by force; not by pressure, as with other systems. It has neither air- nor water-resistance to overcome. Air and condensation are removed from all radiators through return piping, and delivered into the seal on Receiver. From this point the condensation returns to boiler by gravity, while the air is carried off the top of seal, up through air-line into condensing coil, from which the air-line is sealed into chimney. The condensing coil eliminates any possibility of moisture entering the chimney. The draft of the chimney gives at all times an ample pull to free the entire system of air. And it serves also to rapidly pull the Vapor into the radiators. The air being thus exhausted from The Vapor System, no air-valves are needed on radiators. The Special Union Elbow is constructed to freely discharge water and air from the radiators. It prevents heating of the return pipes by means of the seal shown in illustration on page 9.

From the foregoing it will be understood that The Vapor System has a natural and, therefore, an ideal circulation. By no possibility can water ac-

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PHILADELPHIA SCHOOL OF DESIGN FOR WOMEN.

James H. Windrim, Consulting Architect.  
J. W. Cuff & Co., Heating Contractors.



cumulate in radiators or pipes. No other system of heating ever devised approaches the perfection of The Vapor System's circulation.

In self-control (boiler regulation) The Vapor System is as superior as in its circulation.

With the gradual heating up of the radiators, is a gradual checking of the fire. Little by little the lower draft-door closes and the chimney-check opens. When the system is in full operation, the draft-regulating apparatus works continuously,—a little more, a little less fire, as is required to produce vapor in proportion to its consumption. This is accomplished by expansion of water in boiler acting on the draft-regulating float in Receiver, as explained in detailed description of Receiver, page 5.

Now we reach the point in our explanation at which the radiators, being sufficiently heated, cease to consume all the vapor the boiler is producing. Then follows an increase of the vapor in boiler, causing the water to expand to receiver, the latter being open to the atmosphere. As the water rises in receiver, the draft-regulating float is raised, operating the drafts, checking the fire and reducing the production of vapor to an amount necessary to keep the system filled. The most satisfactory and accurate-working automatic draft-regulator ever devised, opening or closing the dampers on change of two ounces in pressure and at any point between zero to fourteen ounces pressure on boiler.

In event of a continued increase in pressure, after the draft is closed, as would result from neglect to close ash-pit door, the rising water in receiver will carry the draft-regulating float up until it lifts the lever controlling the relief valve. The escape of the excess Vapor from the boiler will immediately reduce the pressure; then the water in receiver will drop and relief valve will close.

The distance between water line of boiler and extreme high-water in receiver in no case exceeds two feet. The maximum pressure, therefore, that can ever be on the boiler will equal a column of water two feet high or less than one pound per square inch.

The foregoing explanation of how the fire is checked when radiators reach the maximum heat, is based on the assumption that the valves on all radiators are fully opened.

It should be emphasized that any radiator, on The Vapor System, may be used independently of any, or of all, others.

And that the temperature of every radiator may be regulated to meet the necessity of the moment, as explained in the description of Quintuple Valve.

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MONTANA CLUB, HELENA, MONT.

C. Gilbert, Architect.  
John Sturrock, Heating Contractor.



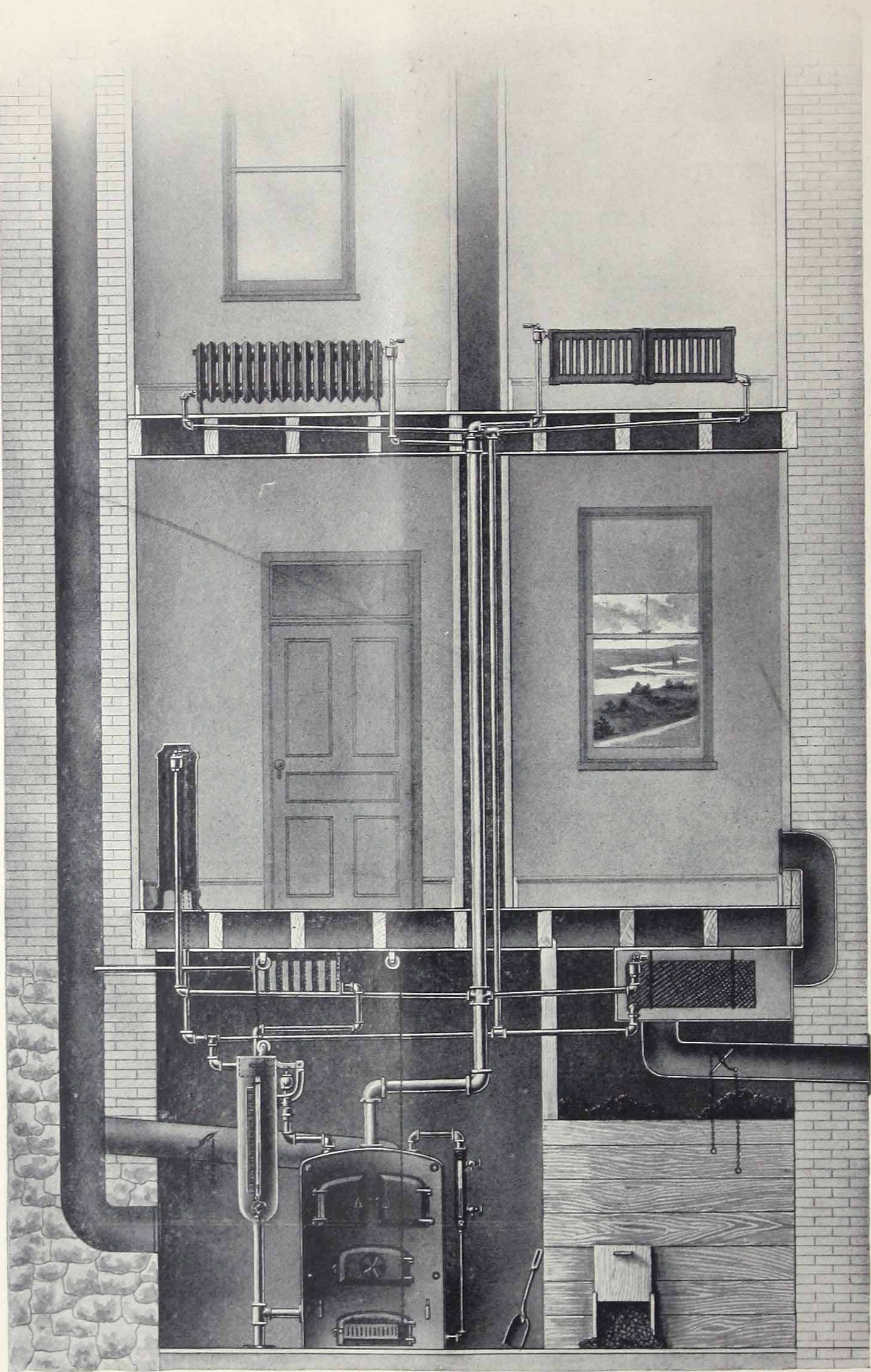
The boiler regulating apparatus responds as perfectly when radiator-valves are partly opened as when fully opened. With quarter-open valves, Vapor is produced to heat a fourth (approximately) of the surface of the radiators; then the fire is automatically checked, as has been described. The same applies to half-open valves with half of the radiator surface heated; and to three-quarters open valves with three-fourths of the surface heated. So sensitive is the regulating apparatus that the opening or closing of an individual radiator-valve acts on the fire, checking it or stimulating it as the case may be.

By way of illustration, take The Vapor System in a residence: At bedtime certain radiators are half closed; others are turned back to the quarter; still others are entirely shut off, say, in sleeping rooms. The fire is held in check during the night—held in check by the vapor accumulating in boiler, expanding the water in receiver, and thus keeping the draft closed and chimney-check open. In the morning, when the valves are opened, the accumulated Vapor flows immediately into the radiators, quickly heating them. At the same time the fire is started up by the automatic opening of the boiler draft and closing of chimney-check. In short, you start up your fire in the morning simply by opening the radiator-valves.

With The Vapor System heat is produced in the exact ratio that heat is consumed. There is no waste. Never too much, yet always plenty. The amount of heat is limited only by the requirements of the weather.

The efficiency and convenience of The Vapor System is conspicuously demonstrated by extreme requirements. Other systems are usually insufficient in very severe weather, and are never temperate enough for mild days. The advantages of the Vapor System are appreciated no less in the early fall and late spring than in mid-winter. In the seasons of warm days and cold nights a little heat is needed morning and evening to take off the chill, but none during the day. Neither steam nor hot-water meets this need. With The Vapor System simply open the boiler door and pipes and radiators become cold; close the door and the system is heated again—in fifteen to twenty minutes.





HOW TO PIPE A SMALL VAPOR PLANT



# Superiority of The Vapor System

AS COMPARED WITH STEAM AND WITH  
HOT-WATER HEATING.

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THE VAPOR SYSTEM OPERATES WITHOUT PRESSURE ON PIPING  
AND RADIATORS, THE SYSTEM BEING OPEN  
TO THE ATMOSPHERE.

Steam requires pounds of pressure, as against ounces with Vapor. Boiler pressure on a steam system is exerted on pipes and radiators, the system being closed, since both supply and return are connected directly to boiler. And where there is pressure on piping it is very difficult to eliminate the snapping, cracking noises incident to pressure expansion and the subsequent contraction. With The Vapor System pressure on boiler is limited to the amount necessary to operate drafts, say, two to six ounces. The piping and radiators are at all times free of pressure, since the return line is open to the atmosphere.

*A hot-water system*, first, is required to withstand the great weight of the water with which it is filled. Without warning and without apparent cause, a fitting will break, a radiator loop split, bonnet of valve come off, or one of many things may happen, causing damage to the building and furnishings, and involving costly repairs.

Then, provision must be made for expansion, the water when heated expanding about  $1/25$  of its volume. Accordingly, hot-water systems are erected with an expansion tank or on the closed system with relief valve. Both plans are open to serious objections.

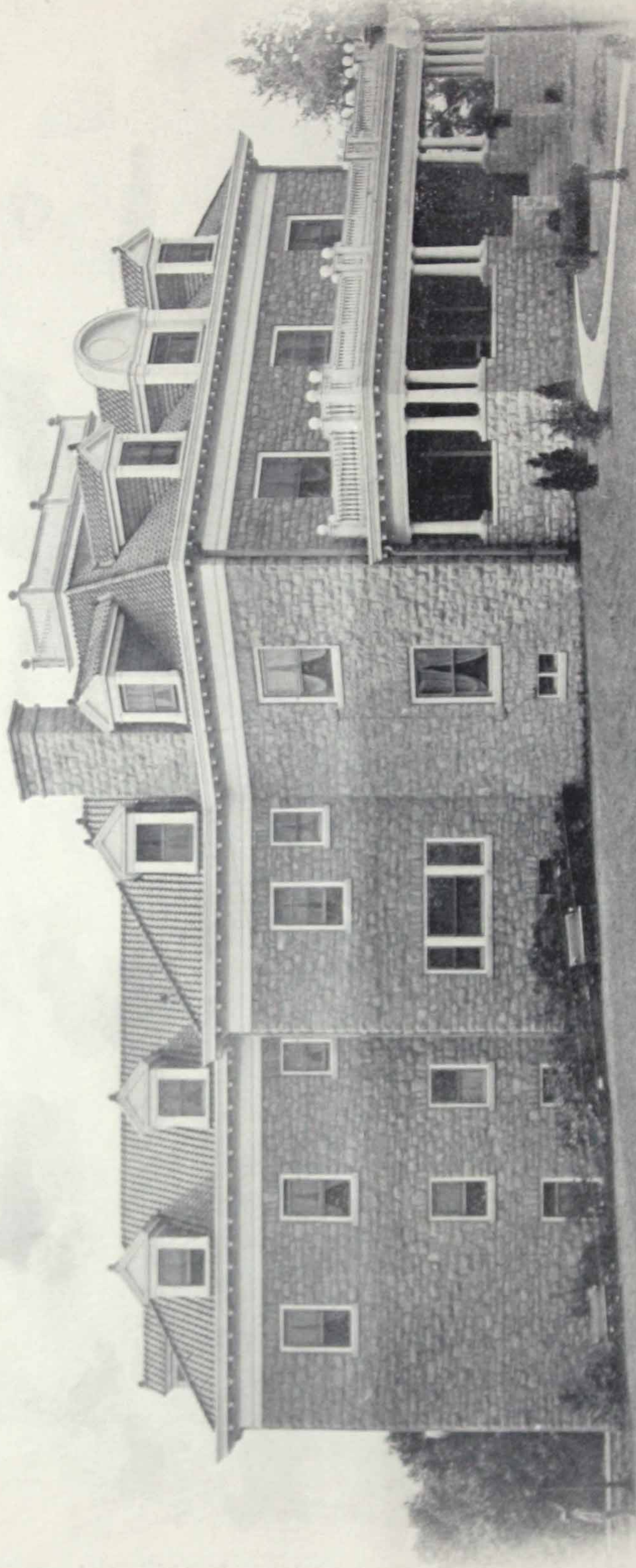
An expansion tank must be located above all radiators, and often where it is difficult to prevent freezing. In cold weather care must be taken to maintain circulation throughout the entire system; all radiator valves must be kept open, and air-valves must be opened frequently. Without this precaution, not only expansion tank but radiators and pipes will freeze and burst. Or, should the fire burn up, and the water get too hot, it will boil in expansion tank, and frequently out over the sides of the tank, flooding everything below.

If a relief valve is used, it may fail to work, as these valves often do, throwing too much pressure on the system, with a result that radiators or pipes burst, and a flood follows as a matter of course.

Above all things, a closed hot-water system, running under pressure, is to be avoided.

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RESIDENCE OF GEORGE L. BODENSTEIN, FORT WASHINGTON, PA.

KRIEBEL & CO., Heating Contractors.



Accidents usually happen during the coldest weather, involving not only loss by the damage done and expense of repairs, but great personal inconvenience.

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THE VAPOR SYSTEM OPERATES WITHOUT AIR-VALVES  
ON RADIATORS.

*Steam Systems*, with the exception noted below, require every radiator to be provided with an air-valve. Automatic valves, being delicate pieces of mechanism, need adjustment and care by an expert; otherwise they cease to be automatic, and are a source of continual trouble. Not infrequently a room is flooded, and floor-coverings are ruined, by water escaping through an automatic valve. If hand air-valves are used, it is necessary to open them in the morning, or every time steam goes down in the boiler; otherwise radiators will not heat when steam is again made. Air-valves are also highly objectionable because of the noxious gases they discharge.

With a steam system, in which an air pump is employed, air-valves on radiators are dispensed with, but such a system is only feasible where a professional engineer is employed.

*The hot-water system* also requires air-valves. These valves are opened and closed by hand. There is always the chance that an air-valve will be left open by oversight. And it generally happens that the valve so left open is in a place where the most serious damage results.

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THE VAPOR SYSTEM OPERATES NOISELESSLY.

*The steam system* is capable of producing the most distressing noises imaginable. Everyone is familiar with the nerve-jarring rattle, thump and jump of steam pipes and radiators, caused by contact of cold water and live steam.

---

THE VAPOR SYSTEM OPERATES AUTOMATICALLY; REQUIRING  
ATTENTION ONLY TO FUEL AND ASHES.

*The steam system* cannot be trusted to automatic control, but—whether double-valve, single-valve, or vacuum—requires constant watching and attention.

*The hot-water system* is also without satisfactory automatic control because, thus far, no damper-regulator has been devised that will automatically regulate the draft in a hot-water heater. This is a serious objection, making it necessary for some one to visit the heater several times a day, to properly set dampers and control fire.

---

THE VAPOR SYSTEM ADMITS OF ACCURATE REGULATION  
OF HEAT IN EACH RADIATOR.

*The steam system* is universally criticized because it is either "too cold" or "too hot." The theory when heating by steam is to use a radiator of sufficient size to heat the room in coldest weather. It follows, necessarily, that radiator is too large for moderate weather.

VAPOR HEATING COMPANY, PHILADELPHIA.





RESIDENCE OF F. A. SPERRY, CRANFORD, N. J.

John L. Reid, Heating Contractor.



RESIDENCE OF DR. W. A. STEWART, PITTSBURGH, PA.

Century Architect and Engineering Co., Architects.  
Snively Heating Co., Heating Contractors.



It is impossible to regulate the amount of steam delivered to radiators, working on the gravity system. If the supply valve is partially shut, in an attempt to control the temperature of the room by admitting less steam, the radiator will not work properly and in a short time will fill with water. The valves must be wide open, or entirely closed.

*The hot-water system*, in respect to the regulation of heat, is an improvement on steam, but not more so than The Vapor System is on hot-water. In hot-water heating, temperature changes are very slow. When the weather is extremely cold, or the fire is low, and the water-temperature has fallen, it takes the greater part of the day to get up enough heat for comfort. On the other hand, when the house becomes over-heated, as is likely towards evening, it takes about as long to reduce the temperature of the water with which the system is filled. Windows are impatiently thrown open, causing drafts and endangering health. With The Vapor System you can have as much heat, or as little, as conditions require, and without delay.

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THE VAPOR SYSTEM ACCUMULATES NO WATER  
IN RADIATORS AND PIPES.

*The hot-water system* is, of course, filled with water. The dangers from the weight of the great volume of water in pipes and radiators, and of the evils of the expansion of this water, have already had comment.

*The steam system* constantly accumulates water in radiators and pipes. If automatic air-valves are on radiators, the water soon reaches them and escapes; carpets, furniture and ceiling are ruined. After a radiator has filled, with water and a valve is opened to again heat it, the water, passing from radiator and meeting hot steam in pipes below, makes a dreadful noise.

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THE VAPOR SYSTEM IS SAFE AND DEPENDABLE.

—NO POSSIBILITY OF CRACKS IN PIPES,  
BREAKS IN RADIATORS, NOR  
INJURY TO BOILER.

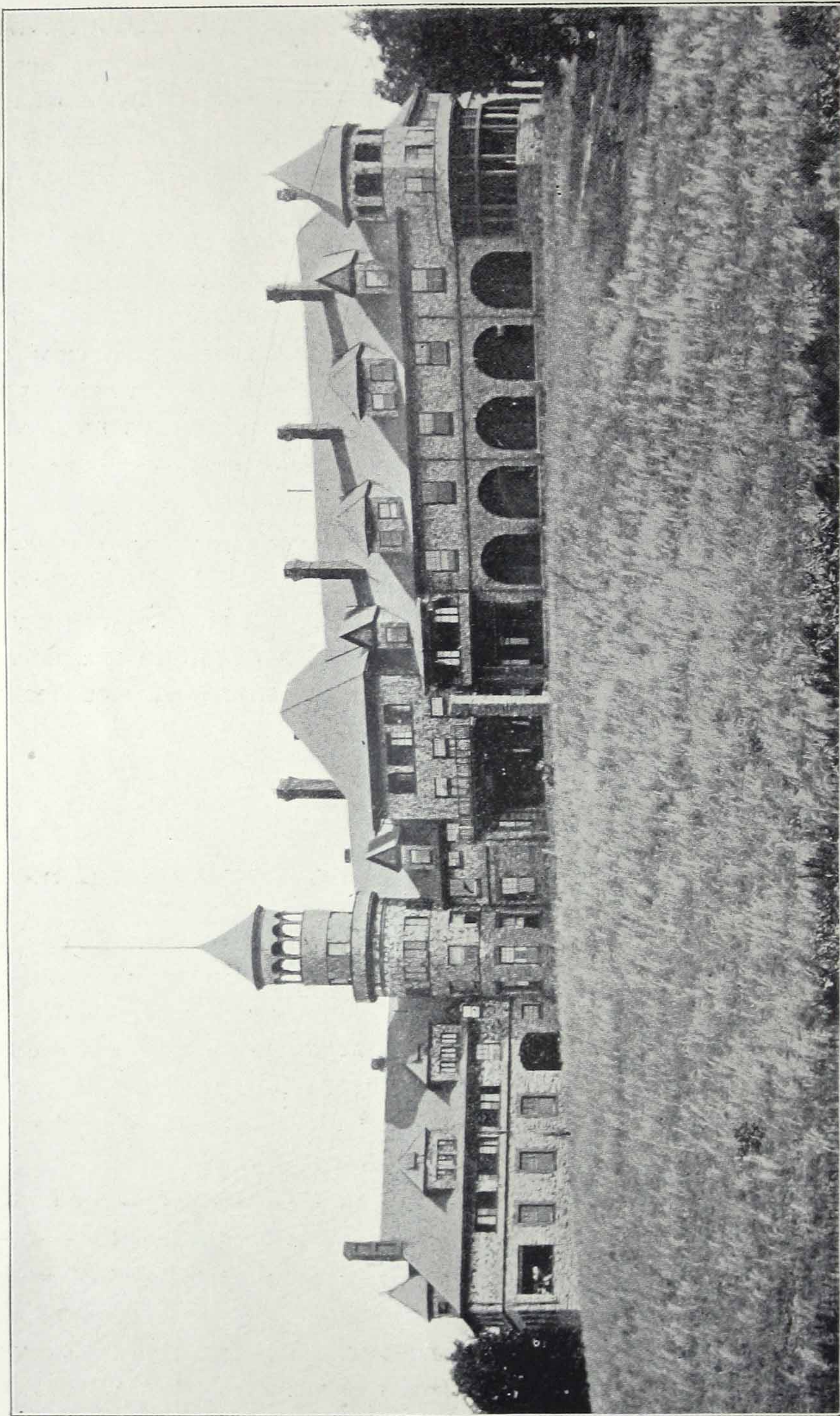
*The hot-water system*, sustaining, as it does, tremendous pressure, is liable to accident at any moment, as already pointed out.

*The steam system*, being also under pressure (unless operated by machinery producing a vacuum), is subject to accidents similar to the hot-water system. But the chief source of trouble is the boiler. One radiator filling with water may take out of the boiler sufficient to bring the water line below crown sheet or other exposed surface. If the boiler is cast-iron it is almost certain to crack. A steel boiler blisters and finally collapses.

The attendant, noticing that the boiler has suddenly lost water, should locate and open the radiators which contain this water. Instead of doing so, however, he is more likely to take the easier way—he fills the boiler

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NATIONAL HOME B. P. O. of ELKS, BEDFORD CITY, VA.

Irwin J. French, Heating Contractor.



to the proper point. Later, someone opens the flooded radiators, all the water returns to the boiler, perhaps filling it above steam outlet, stopping circulation of steam and causing a tremendous pounding in the piping. Or, should the lack of water in boiler remain unnoticed, and a flooded radiator be opened, the water will rush into the boiler over the very hot surfaces, and be instantly converted into steam, at a high and sometimes dangerous pressure. Boiler explosions are caused in this way.

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#### THE VAPOR SYSTEM HAS QUICKER AND FREER CIRCULATION.

*The hot-water system* presents engineering difficulties in circulation to which steamfitters are not always equal. Even when perfectly installed, serious interruption to free circulation is caused by the shutting off of radiators in overheated rooms. A closed radiator here and there on a system may stop circulation altogether.

*On steam systems* circulation is constantly interrupted by the presence of water and air in pipes and radiators, unless operated by machinery.

With The Vapor System, simply open the valve and the radiator heats up at once—no water there, nor even air, that can obstruct or interfere with the vapor. The chimney suction on condensing coil exhausts the air and draws the vapor into radiators.

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#### THE VAPOR SYSTEM'S RADIATOR-VALVES ARE NEVER TROUBLESOME.

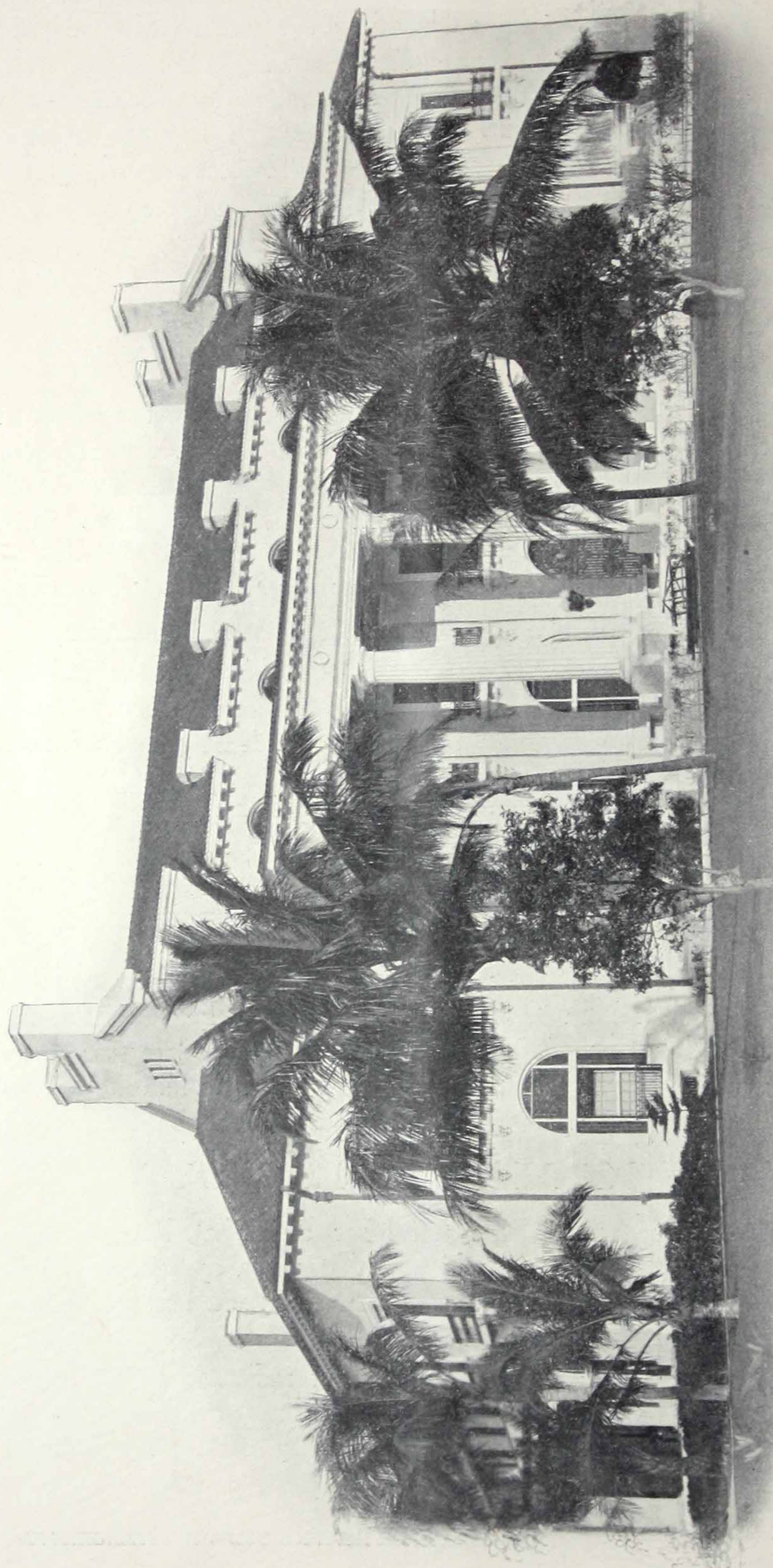
*The steam system*, with two valves, makes it necessary, when a radiator is shut off, to close both throttles. If either one be left open, the radiator will fill with water. The valves, being opened and closed so frequently, soon become defective and leak sufficient steam to fill the radiators with water. This continual opening and closing also wears out the packing around valve stems, making it necessary to have them repacked; otherwise there is a continual leakage of steam into the room.

The single valve system reduces the labor somewhat, but the same annoyance remains, not the least of which is that, when opened, or closed, the services of someone with an unusually powerful hand and strong arm are required to again move the valve.

*A hot-water system* requires the same type of radiator-valve as steam. With both hot-water and steam the valves are placed near the floor, whereas, with Vapor, the valve is at the top of radiator in easy reach. The pressure of a finger is sufficient to turn it.

VAPOR HEATING COMPANY, PHILADELPHIA.





RESIDENCE OF HENRY M. FLAGLER, PALM BEACH, FLA.

Carrere & Hastings, Architects.  
Broomell, Schmidt & Steacy Co., Heating Contractors



THE VAPOR SYSTEM IS MORE ECONOMICAL THAN HOT  
WATER OR STEAM.

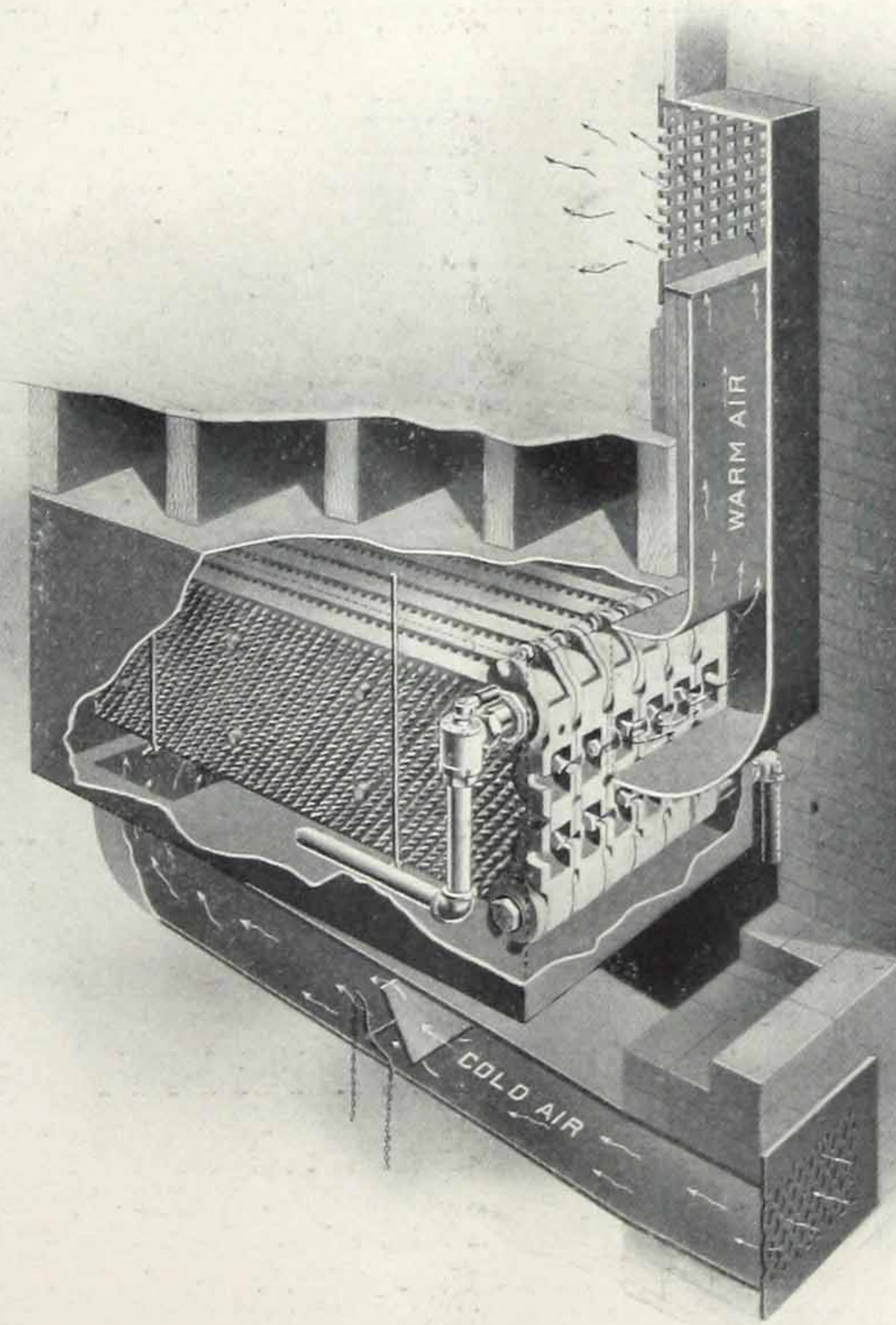
—PRODUCES BETTER RESULTS WITH  
SMALLER FUEL CONSUMPTION.

This is, of course, the logical result of the combined points of superiority. The Vapor System saves on fuel because boiler and piping are smaller; because it operates without pressure; because of the practically perfect automatic control of boiler; because of the accurate regulation of heat; because no water can accumulate in radiators and pipes; because the circulation is quicker and freer; and, because there is no waste.

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THE VAPOR SYSTEM IS SUPERIOR IN THE QUALITY OF HEAT.

It is always temperate. It does not run to extremes; it is never violent, never deficient. On the bitterest days, there is ample for healthful warmth; in mild weather, there is just enough for comfort. The Vapor System responds to every change of weather.



INDIRECT HEATING BY VAPOR.

VAPOR HEATING COMPANY, PHILADELPHIA.



## How to Order.

Send us particulars as to size of building, location, number and size of rooms, with sketches, if possible, showing the different floors, and we will advise you approximately the number of radiators and the amount of radiating surface required.

After you determine to adopt The Vapor System, and so advise us, we will prepare drawings and specifications, complete in every detail.

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We do not do construction work, but act as engineers, taking the same place with the owner in reference to heating that the architect does in reference to building. We will gladly assist you, however, in obtaining bids and securing the most reasonable prices.

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The Broomell Vapor System and, as well, the special valves, union elbows and automatic receiver are protected by patents.

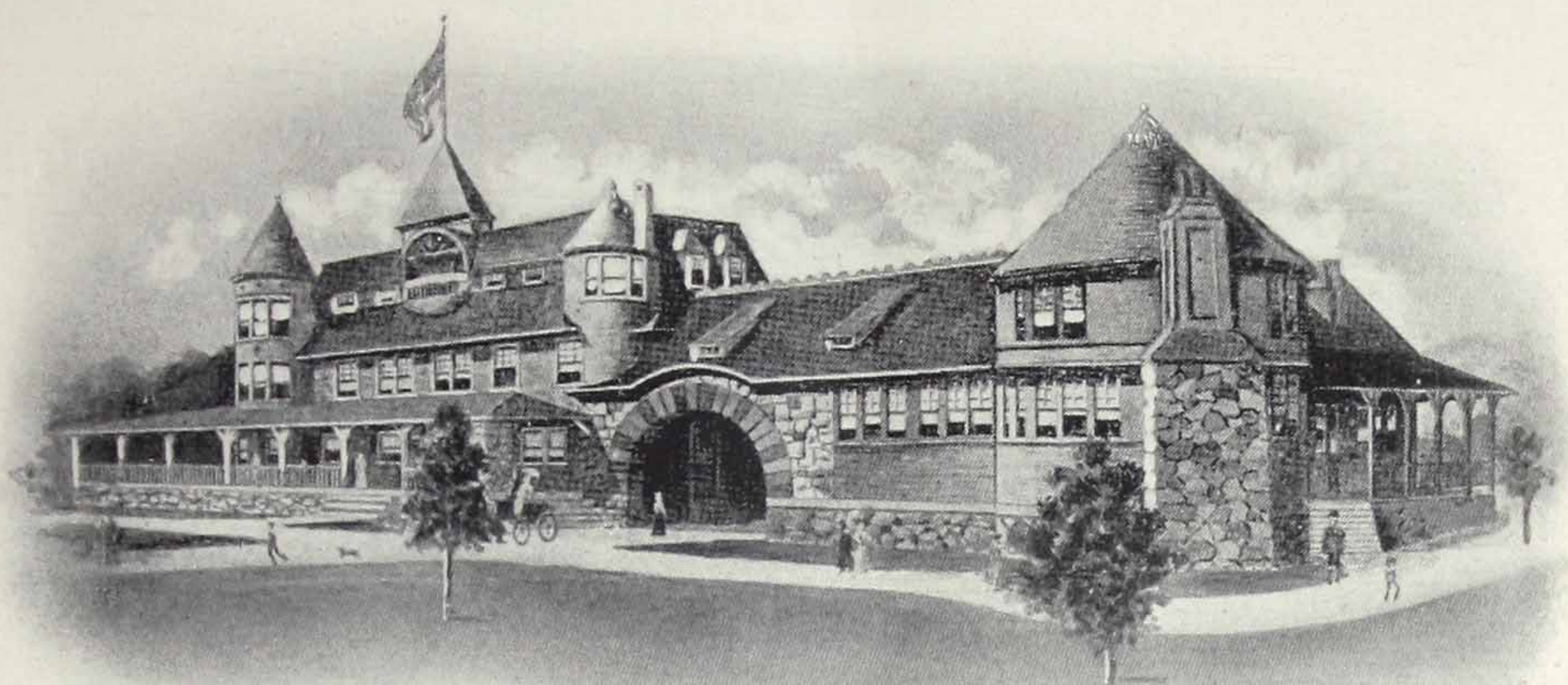
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VAPOR HEATING COMPANY

917 Arch Street

PHILADELPHIA





WILLS MOUNTAIN SANITARIUM, CUMBERLAND, MD.

John W. Rhind, Heating Contractor.



YORK HOSPITAL, YORK, PA.

J. A. Dempwolf, Architect.  
Broomell, Schmidt & Steacy Co., Heating Contractors.

VAPOR HEATING COMPANY, PHILADELPHIA.





WISSAHICKON M. E. CHURCH, WISSAHICKON, PA.

Hales & Ballinger, Architects.  
Philadelphia Steam Heating Co., Contractor.





RESIDENCE OF DANIEL BAUGH, PHILADELPHIA.

Hazelhurst & Huckle, Architects.

DELAWARE RIVER CHEMICAL WORKS

Baugh & Sons Company  
Philadelphia

VAPOR HEATING COMPANY,

917 Arch Street, Philadelphia.

Gentlemen:—The interest you have shown in the satisfactory performance of The Vapor System which you installed in my house nearly a year and a-half ago has gratified my sense of appreciation.

The new work was adapted to a rather complicated two-boiler plant of two  $4\frac{1}{2}$  Mills boilers, where steam under unusually high pressure for house heating, namely 8 to 9 pounds, had proved inadequate. Your proposition to introduce Vapor with a far less number of ounces than I had been using pounds upon the gauges was rather startling, and I could not help feeling skeptical on general principles. The information and experience then available to form a judgment made me doubt even against my wishes and hopes.

The results have satisfied me that The Vapor System amply fulfills all you claim for it; indeed, I am convinced that in regard to uniformity of heat, prompt effect and economy of fuel, it is the best and most "common-sense" method of heating now in use. I find that one boiler on Vapor, which is all that I have been using since the plant was changed, has more efficiency with Vapor than the two had when used for straight steam. The entire house is heated by what is known as indirect system, which, of course, requires more boiler capacity and a greater amount of coal consumption.

Your statements of what the improvement would be, when you made a preliminary survey of my plant at my request, now seems to me rather conservative.

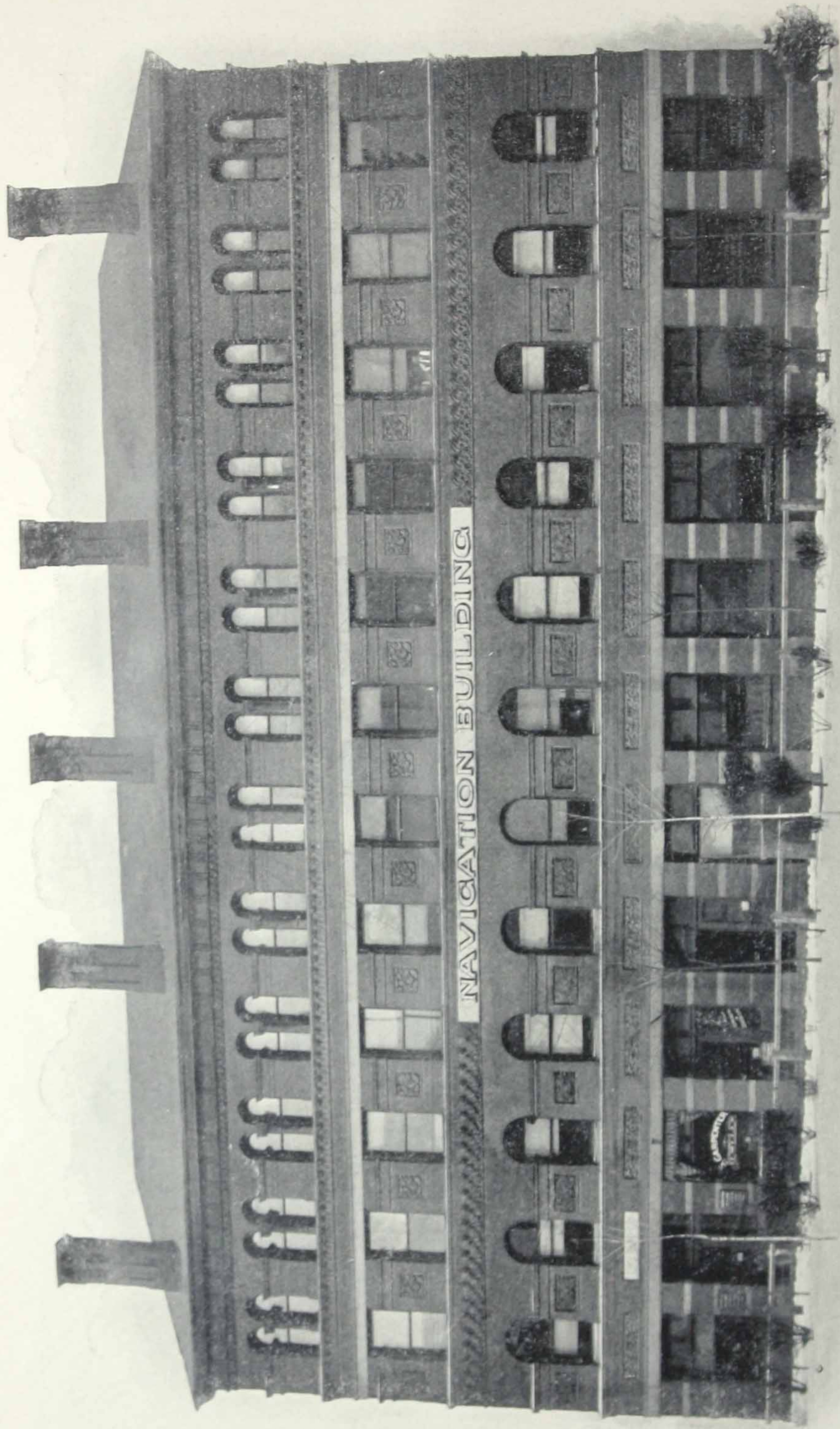
While the work was in progress, and since its perfect installation, your ready assistance in everything which pertained to domestic convenience, as well as in securing the best practical execution of the work, merits my highest commendation.

Yours very truly,

(Signed) DANIEL BAUGH.

VAPOR HEATING COMPANY, PHILADELPHIA.





NAVIGATION BUILDING, MAUCH CHUNK, PA.

Schick & Houseman, Heating Contractors.



THE LEHIGH COAL AND NAVIGATION CO.,

Navigation Building, Mauch Chunk, Pa.

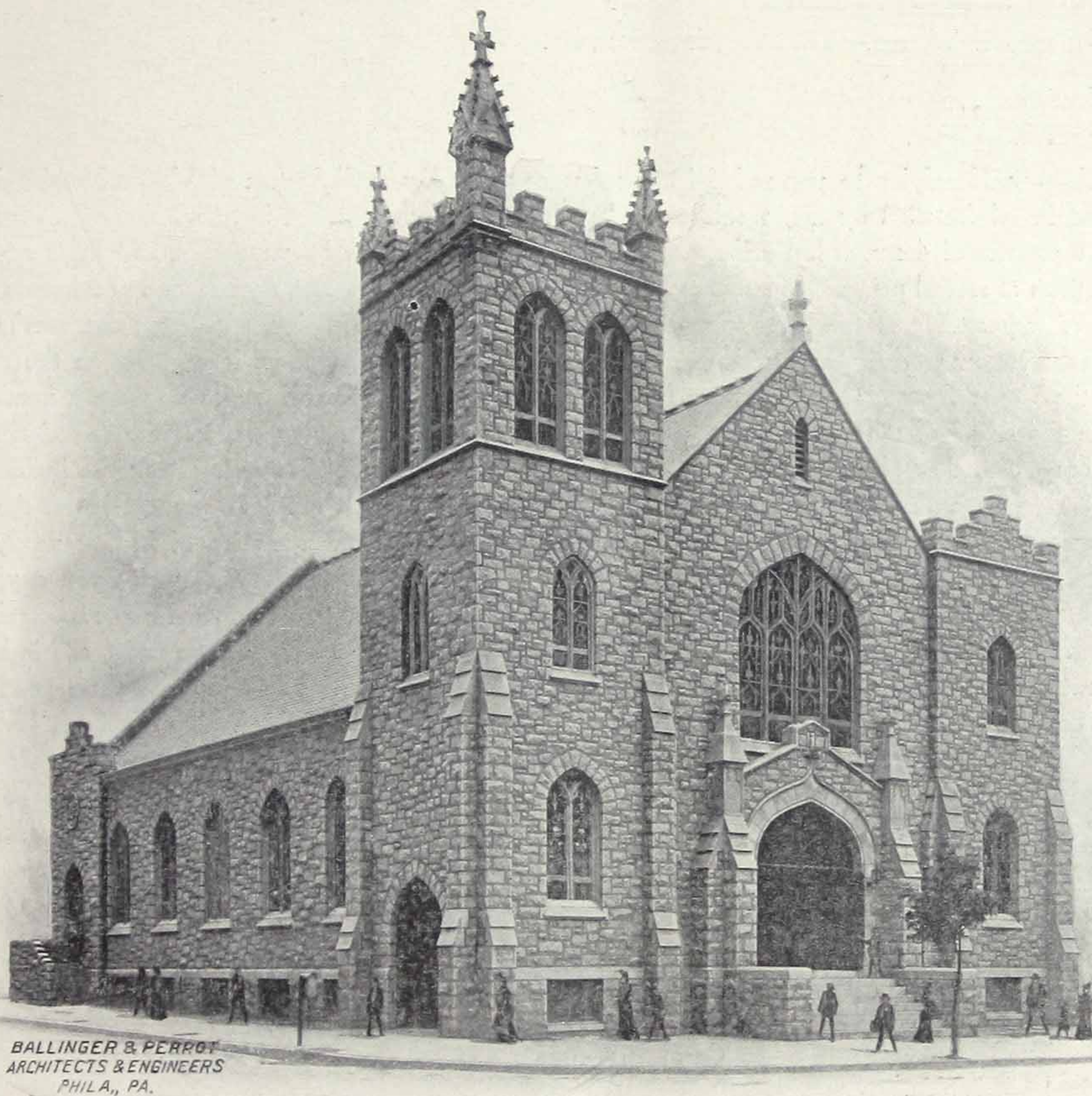
In re. "Broomell" Vapor Heating System in Navigation Building, Mauch Chunk, Pa.

The installation of the heating plant consists of two boilers having a combined capacity of 5,150 square feet. The radiation furnished the building is 4,225 square feet.

Comparing the coal consumption of a year ago with this winter, we consumed with the old steam plant from December 1st, 1902, to January 11th, 1903, an average of 1,950 lbs. of pea and buckwheat coal per day, as against 1,330 lbs. of buckwheat coal during the same period this winter, and from January 11th, 1903, to February 23d, 1903, an average of 1,930 lbs. pea and buckwheat coal per day, as against 1,135 lbs. buckwheat covering the same period this year. We not only burn cheaper fuel with the Vapor System, but also consume, as the above figures will show, about one-half less fuel during a winter that is very much more severe.

Yours truly,

JOHN RUDDLE.



GETHSEMANE M. E. CHURCH, PHILADELPHIA.

Ballinger & Perot, Architects.  
Krieble & Co., Heating Contractors.

VAPOR HEATING COMPANY, PHILADELPHIA.



GEORGE Y. WORTHINGTON

Ames Building, 1419-29 G Street, N. W., Washington, D. C.

Vapor Heating Co.,  
Philadelphia, Pa.

Gentlemen:—Our Company feels deeply grateful to the person who first called our attention to The Broomell Vapor System of heating. We think we have in it the perfect heating plant, though we must say it has not yet been tested in extremely cold weather. On this point we feel no fear, as the smaller of our boilers is more than ample for average winter weather.

We are particularly pleased with your valve, as it enables us to temper the rooms of our patients to suit their whims.

Yours,

THE WILLS MOUNTAIN SANATORIUM CO.

(Signed) GEORGE Y. WORTHINGTON,  
Secretary.

CENTRAL MACHINE WORKS

W. PARKE CUMMINGS

Store and Office, 21 West Chestnut Street, Lancaster, Pa.

Vapor Heating Co.,  
Philadelphia.

Gentlemen:—Replying to yours of 4/12 in reference to the Broomell System of Vapor Heating in the Wheatland Hotel installed by me, would say that when this plant was first installed, the circulation was perfect at a pressure of 4 ozs. or less under very adverse circumstances—mains uncovered, and snow and rain falling on them at several points. In about a year, or when the house was first opened and the boilers fired, the extraordinary settling of the building caused various “traps” in the piping, requiring some overhauling. The apparatus is now working to perfection, and personally I do not believe there is anything on the market equal to the Vapor System for ease of regulation, economy of fuel and results. There were a number of changes in the shape of some of the apartments, particularly the lobby and office, and the radiation is not properly proportioned or placed, but this is entirely the fault or neglect of the architect, or the builder and owner. Otherwise, with over 100 apartments and 150 radiators (85 H. P. in boilers), there is not the least trouble to warm to any desired temperature in the coldest weather. The consumption of fuel, as nearly as I can get at it, is from  $1\frac{1}{2}$  to  $1\frac{3}{4}$  lbs. of bituminous coal per H. P. per hour. Could not give you any comparison with either direct steam or hot water systems, but am satisfied that the same would be considerably in favor of the Vapor System. Have installed Vapor heat in several private houses (large ones), and in a bank and residence, and all are working to the perfect satisfaction of the owners. Have installed three good sized plants for one gentleman, one in 1903, one in 1904, and am about finishing the third. This will show what he thinks of the system. I am also engaged in steam and hot water heating, but when the best is wanted I recommend “Vapor.” Should be glad to furnish any other information in my power, and should the circumstances be favorable would be glad to submit an estimate on installing the plant under consideration. Awaiting your response, I am,

Yours very truly,

W. PARKE CUMMINGS.

Vapor Heating Co.,  
Philadelphia.

Hartford, Conn.

Gentlemen:—In reply to your favor of the 12th inst., would say that the Broomell Vapor Heating System which we installed in the Highland Court Apartments (two years ago, having about 10,000 ft. of radiation) has proved to be all and more than the agents of the Company promised, especially in economy of fuel.

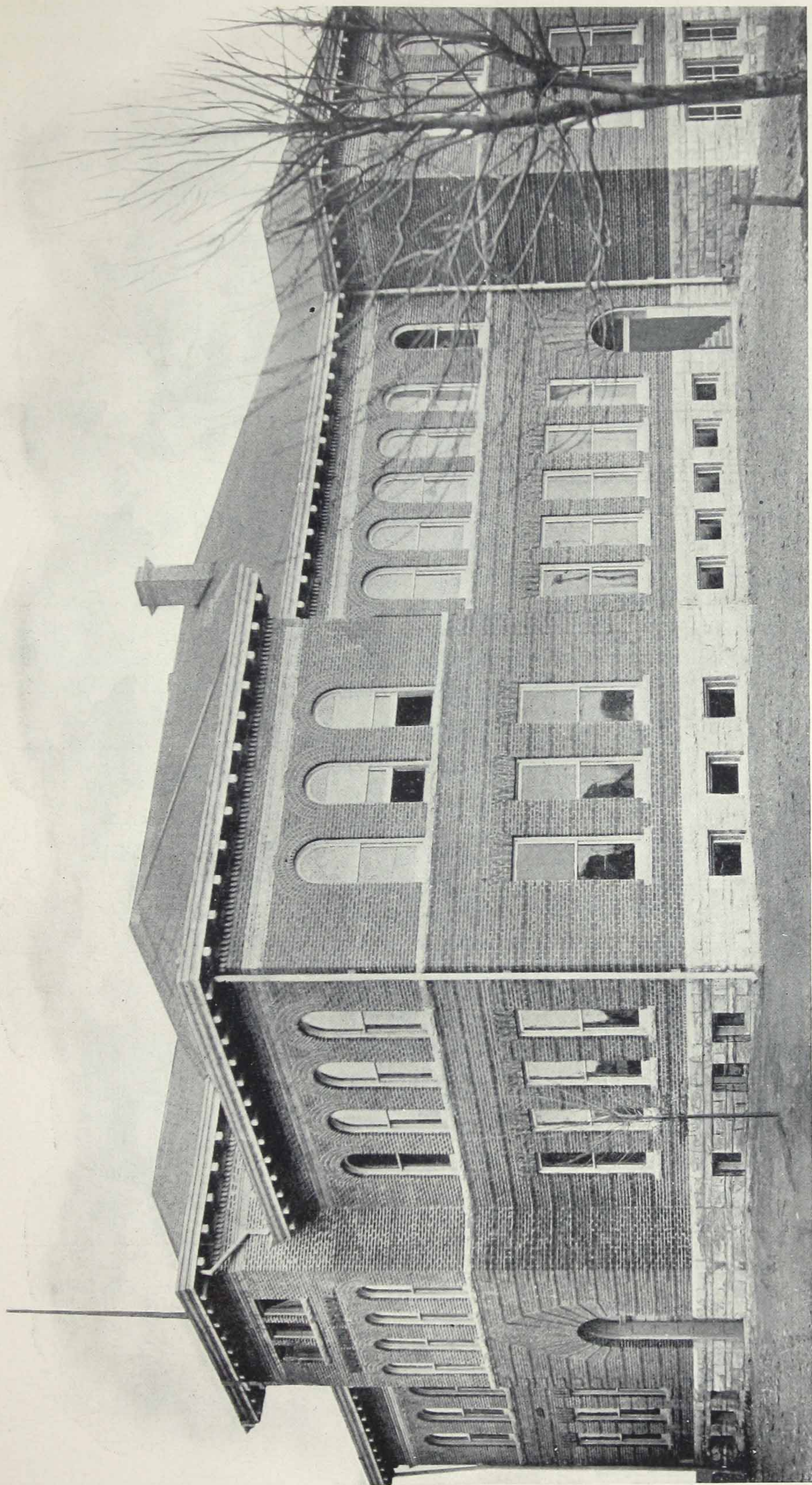
The writer lives in the building and has watched the heating closely. This system greatly surpasses those of steam and hot water in economy and efficiency.

Yours truly,

(Signed) BAYLEY & GOODRICH.

VAPOR HEATING COMPANY, PHILADELPHIA.





DAVIS HIGH SCHOOL, DAVIS, W. VA.

Harry E. Forney, Architect.  
L. A. McGuigan, Heating Contractor.



H. M. FLAGLER  
26 Broadway, New York.

Vapor Heating Co.,  
Philadelphia, Pa.

Dear Sir:—It gives me pleasure to comply with your request and say that the heating plant you installed in my residence at Palm Beach, Fla., is giving me complete satisfaction. I do not know of but one improvement that could be made upon it, and that would be to invent a furnace that would not require any fuel.

Very truly yours,

(Signed) H. M. FLAGLER.

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FLECK BROS. CO.

Fine Plumbing Material, Water, Steam and Gas Supplies

Vapor Heating Co.,  
917 Arch Street, Philadelphia.

Philadelphia, Pa.

Gentlemen:—We have your favor of the 22d inst., and in reply beg to say that the Vapor System installed in our store building has been very satisfactory. After two winters' use we had at no time cause to regret the change which we made from the hot water system, which we previously used in the old building. We have been able to keep our offices warm in the coldest weather, and without forcing the apparatus at any time. The control of volume at every radiator by the Vapor valve is certainly a great improvement over the hot water and steam heating system which we had previously used.

It is with the greatest pleasure we are giving you this report, and will be only too glad to recommend the system to any prospective customers that you may refer to us.

Wishing you much success, we beg to remain,

Yours truly,

FLECK BROS. CO.

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H. F. BACHMAN & CO.

Bankers

121 South Fifth Street, Philadelphia.

Vapor Heating Co.,  
Philadelphia.

Dear Sirs:—Having heard that Broomell's Patent System of vapor heating was superior to that of any other method of heating, I made inquiries amongst those who had been using this method, and heard nothing but favorable reports of your system.

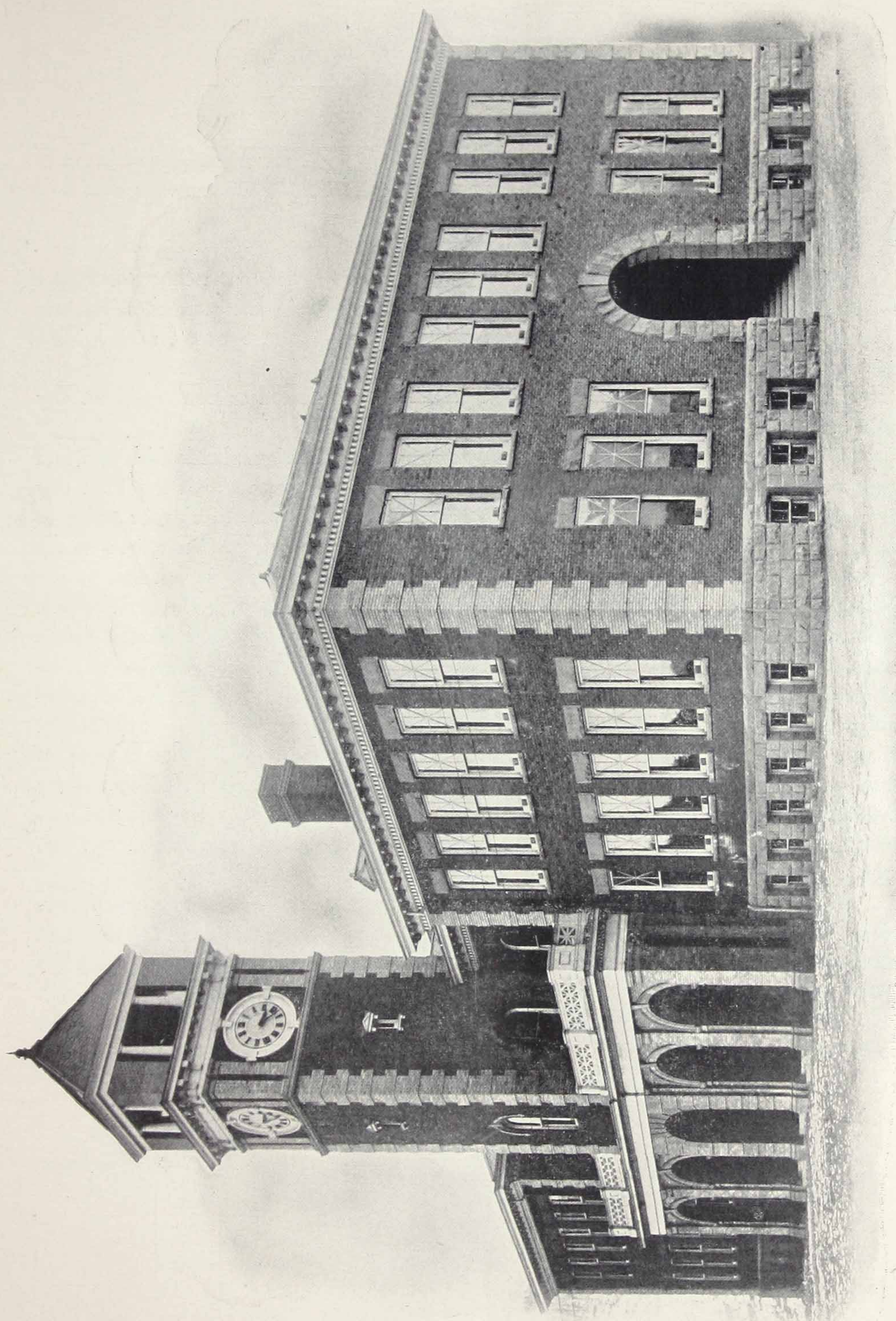
Under the circumstances, I contracted with you to equip my home, 1901 Spring Garden Street, with indirect system of heating, and am prepared to testify to the good results obtained therefrom. My house is exposed on all four sides, notwithstanding which I was able to keep up an even, comfortable temperature in every room during the past winter.

Yours truly,

PENROSE FLEISHER.

VAPOR HEATING COMPANY, PHILADELPHIA.





KEYSER PREPARATORY SCHOOL, KEYSER, W. VA.

Harrison Albright, Architect.  
Warnick & Martin, Heating Contractors.



Great Falls, Montana.

Vapor Heating Company,  
Philadelphia, Pa.

Gentlemen :—We take pleasure in writing you with reference to the Broomell Patent System of Vapor Heating which we had installed in our buildings last summer, completing same so as to turn heat on the 12th of October, 1904. From that time for ninety-nine days we figured the cost for coal to run the plant, and found it was \$340.08. This furnished heat to about 13,000 sq. ft. of radiation, all of which heated uniformly without any noise or leakage, or any air valves to be bothered with.

We also have figured the cost of running a hot water heating plant, which we had removed to install your plant, for the same number of days, ninety-nine, from the 12th day of October, 1903, and found it cost \$345.31 ; at the time we were heating, or trying to do so, about 8,000 sq. feet of radiation. The additional radiation has been used in the new building erected last summer, which was the Nurses' Home and addition to the Maternity Hospital. Our buildings now cover over 300 feet frontage. The main hospital building is a four-story structure, including basement, which is heated. The Nurses' Home is the same, only the basement is not heated. The Maternity is a three-story building, including basement, which is not heated. Our boiler room is located about the centre of buildings directly in rear of same, where we have two 100 horse-power boilers of the Scotch Marine type, internally fired with the Morrison corrugated furnace. In addition to these we have a 36' x 12" tubular boiler, which we use for high pressure work, running laundry machinery and heating water for general uses ; also for sterilizing and flue ventilation purposes, all of which has been taken care of with the fuel we have figured, so you can see, without this addition, the cost for heating would have been a great deal less.

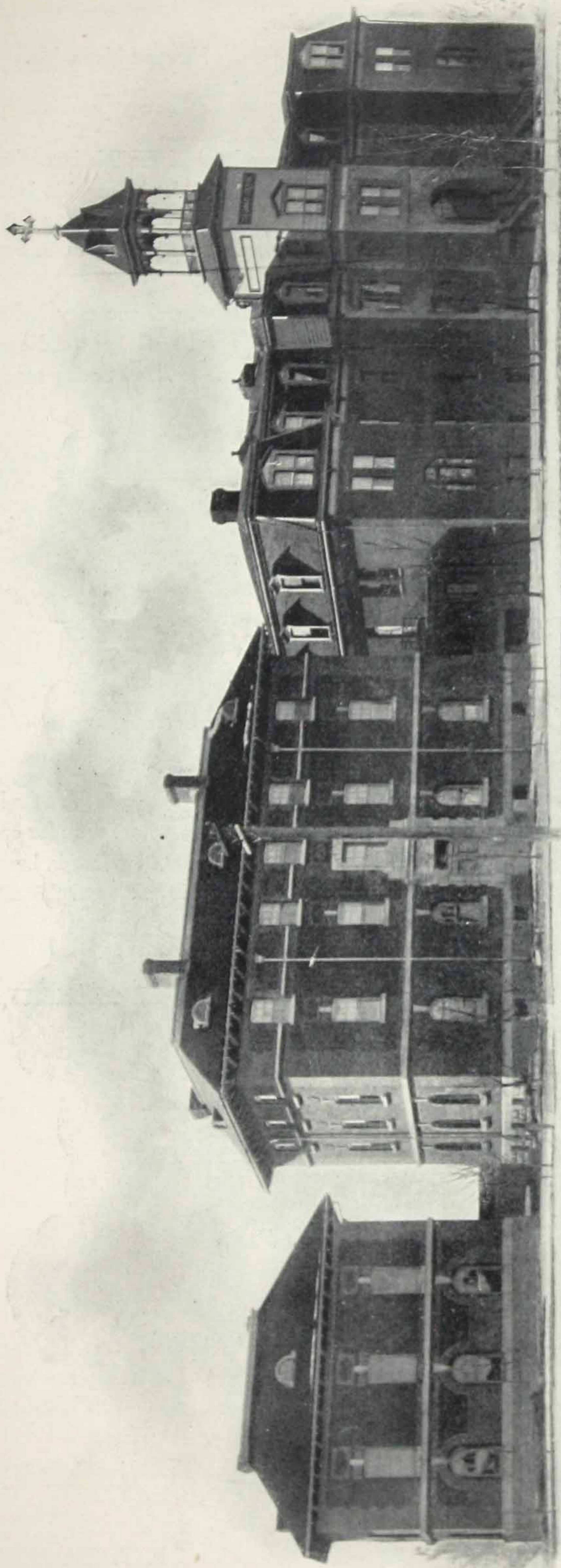
We are very much pleased with the system, so much so, that we have no hesitancy in recommending it to those who contemplate putting in a large heating plant. The absolute certainty of being able to heat the buildings at all times has been demonstrated during the last three weeks, the thermometer registering below zero, and at times, during one real cold snap (unusually cold for this section of the country) over thirty degrees below, we experienced no difficulty in keeping our buildings at the right temperature.

Respectfully,

(Signed) COLUMBUS HOSPITAL.

by Sister Mary Julian.





COLUMBUS HOSPITAL, GREAT FALLS, MONT.

William E. Donovan, Architect.  
John A. Collins, Heating Contractor.

"Central Heating Plant."



OLD DOMINION LAND COMPANY,

L. B. Manville,

*Superintendent.*

Hotel Warwick Building,

Newport News, Va.

Vapor Heating Co.,

No. 917 Arch Street, Philadelphia.

Gentlemen:—It gives me pleasure to state, in response to your letter of the 9th inst., that the heating system which the Broomell-Schmidt Co., of York, Penna., installed in our Hotel Warwick, in the year 1900, has always given perfect satisfaction, and I cannot commend it too highly to those who seek a first class heating system. It is economic to the highest degree, for, except in rare instances, the exhaust steam from our electric plant heats our entire hotel.

You have our permission to make mention of our hotel in your catalog, and you may make such use of this letter as you may see fit. We are glad of the opportunity to testify to the efficiency and economy of the system of heating which we have, and most heartily recommend the same to those having conditions like, or similar, to those of ours.

Very truly yours,

(Signed) L. B. MANVILLE,  
*Supt.*

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WM. H. HORSTMANN COMPANY

Fifth and Cherry Streets,  
Philadelphia.

The Vapor Heating Company,

917 Arch Street, Philadelphia.

Gentlemen:—In as few words as possible you are to be congratulated. You have filled the bill. Instead of freezing last winter, as heretofore, in our 125 foot front, up on the hill property, we were for once absolutely comfortable, and in all parts of the house, no matter what exposure, and the pleasing fact is, burned less coal than with the hot air system, which I discarded at your suggestion. Both the indirects and the directs work to our entire satisfaction.

Sincerely yours,

SAMUEL ECKERT,  
Devon, Pa.

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CHANDLER BROTHERS COMPANY

Bankers and Brokers  
Third and Walnut Sts., Philadelphia.

Vapor Heating Co.,

917 Arch Street, Philadelphia.

Gentlemen:—I am very glad, indeed, to express my entire satisfaction of the Broomell Vapor System of Heating, which I had installed in my residence three years ago. I have never had any cause whatever to realize the outside conditions of the weather, owing to the even temperature which it is possible to maintain without any continual bother with my boiler.

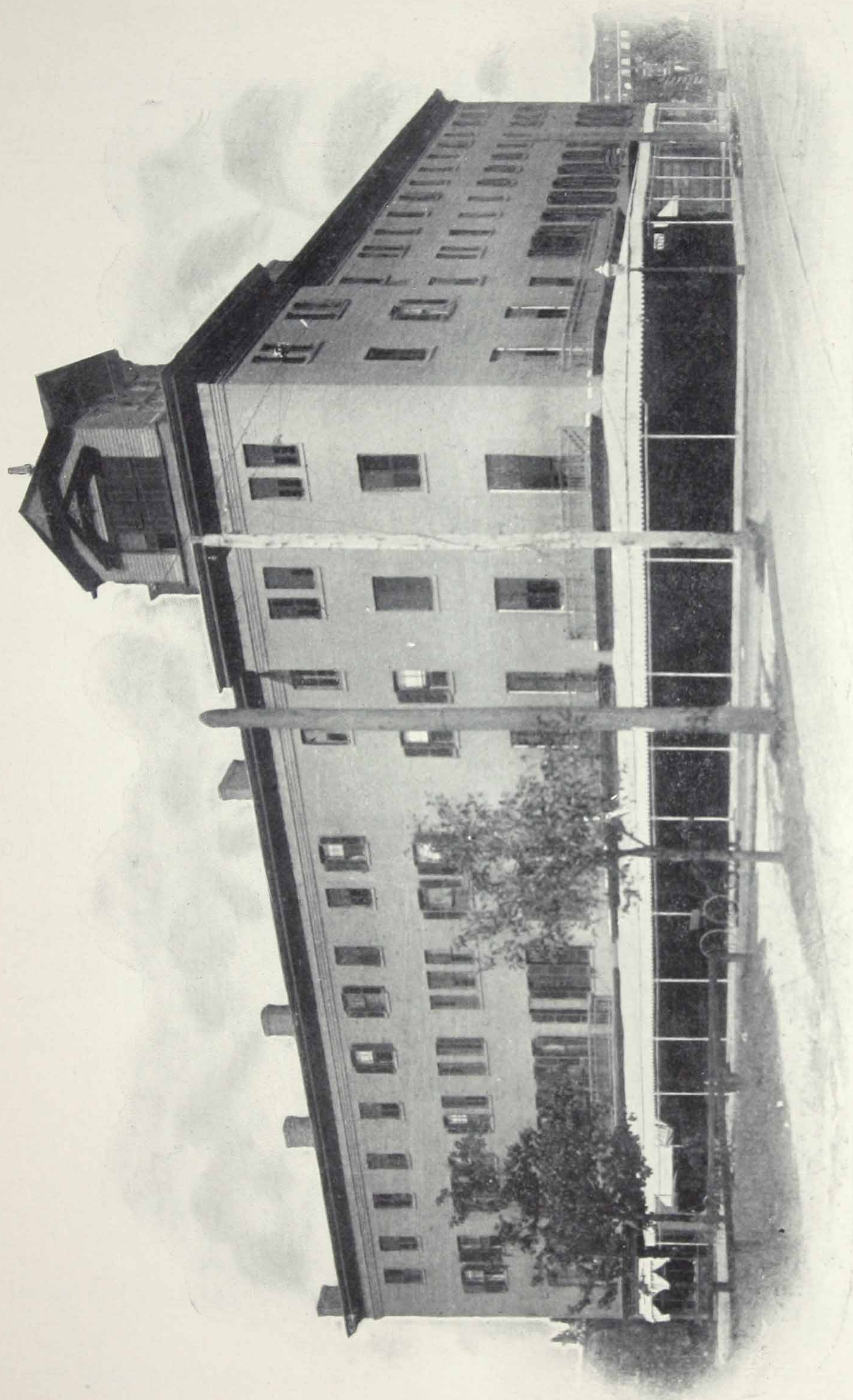
Any one looking for an economical plant and a delightfully heated home should install the Broomell Vapor System of Heating.

Yours very truly,

F. T. CHANDLER.

VAPOR HEATING COMPANY, PHILADELPHIA.





HOTEL WARWICK, NEWPORT NEWS, VA.

Broomell, Schmidt & Stacey, Heating Contractors.



CHARLES SYLVESTER

Real Estate Broker

615 Walnut St.

Philadelphia.

Vapor Heating Co.,  
Philadelphia.

Gentlemen:—Replying to your favor of 4th inst., I have no objection to your inserting cut of the building, 615 Walnut Street, in your new catalogue of your steam heating apparatus.

In answer to your inquiry, I would state that the heating plant installed in this building has proved satisfactory.

Yours truly,

CHARLES SYLVESTER.

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AMERICAN LEATHER COMPANY

Shoe Leathers

Warerooms, 17-19 Ferry St., N. Y.

Wilmington, Del.

Vapor Heating Co.,  
917 Arch St., Philadelphia, Pa.

Gentlemen:—Replying to your inquiry as to how I like your heating system, will say that after two winters use of it in the "Marion Apartment House," and for a short period in my own home, that I find it economical in operation, free from the annoyance of thumping pipes, with no air or other valves to cause leaks or drips, perfectly controllable as to amount of heat desired at different seasons and in different rooms requiring different temperatures. In short, it has proven perfectly satisfactory to me. I prefer it to any heating system of which I have any knowledge.

Respectfully yours,

J. PARKE POSTLES.

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BODENSTEIN & KUEMMERLE, Inc.

Chair Manufacturers

Lawrence Street and Girard Avenue

Philadelphia.

Vapor Heating Co.,  
Philadelphia, Pa.

Gentlemen:—Replying to your inquiry whether your system of Vapor Heating continues to give good satisfaction, I take pleasure in informing you that I have used same for nearly three years, and still have the first complaint to make. My house has 22 rooms, and stands in the country, exposed on all sides, yet I had no difficulty during the last two severe winters in maintaining an even temperature in every room. I am also well satisfied that I am saving coal by using your system.

Yours very truly,

GEO. BODENSTEIN.

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WILLIAM W. CHAMBERLAINE

P. O. Box 495

Norfolk, Va.

Vapor Heating Co.,  
Philadelphia.

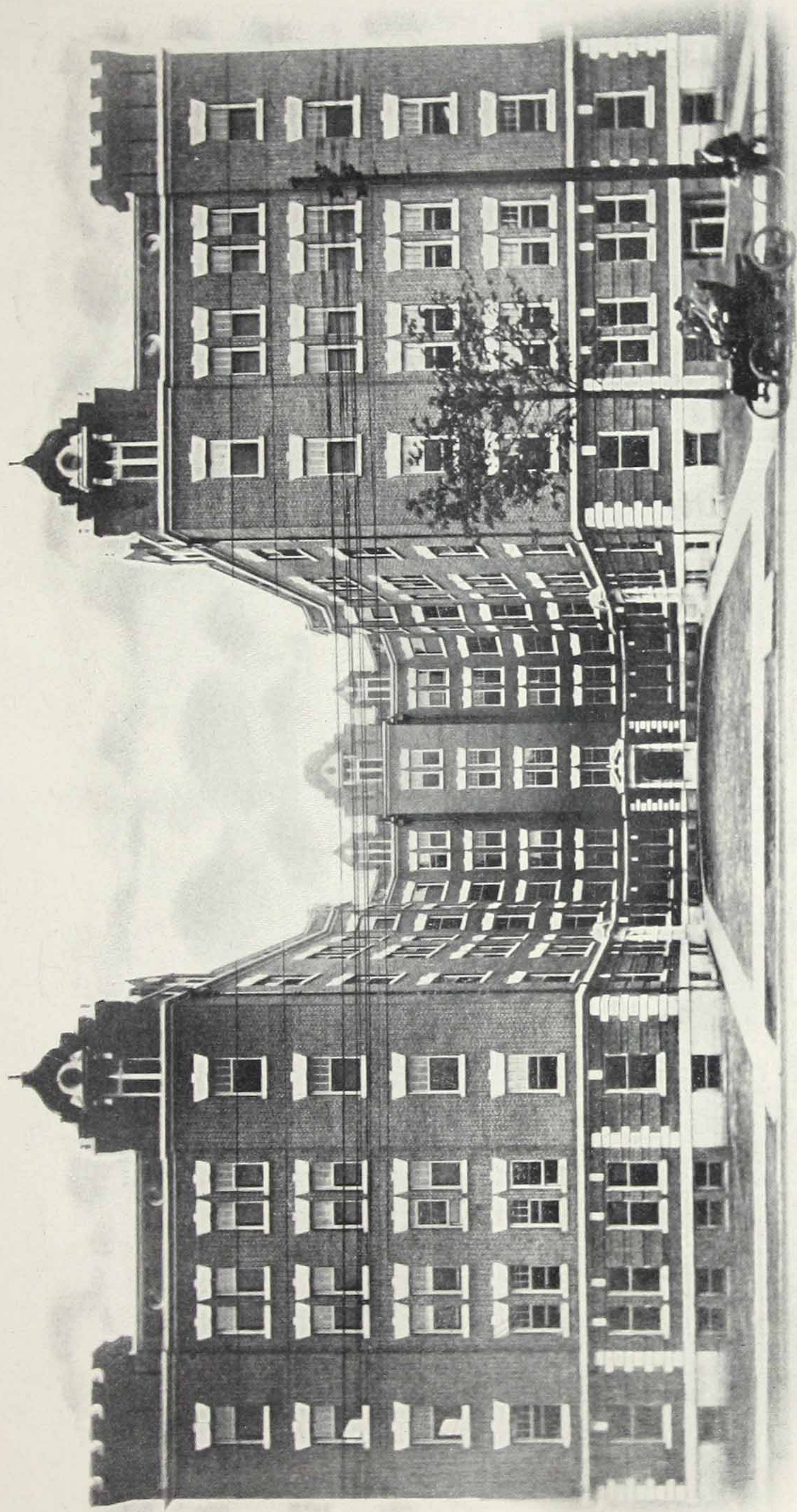
Gentlemen:—The vapor heating plant which you put in our building in this city has now been used for two seasons, and has given entire satisfaction, performing all that was promised for it.

Yours very truly,

WM. W. CHAMBERLAINE.

VAPOR HEATING COMPANY, PHILADELPHIA.



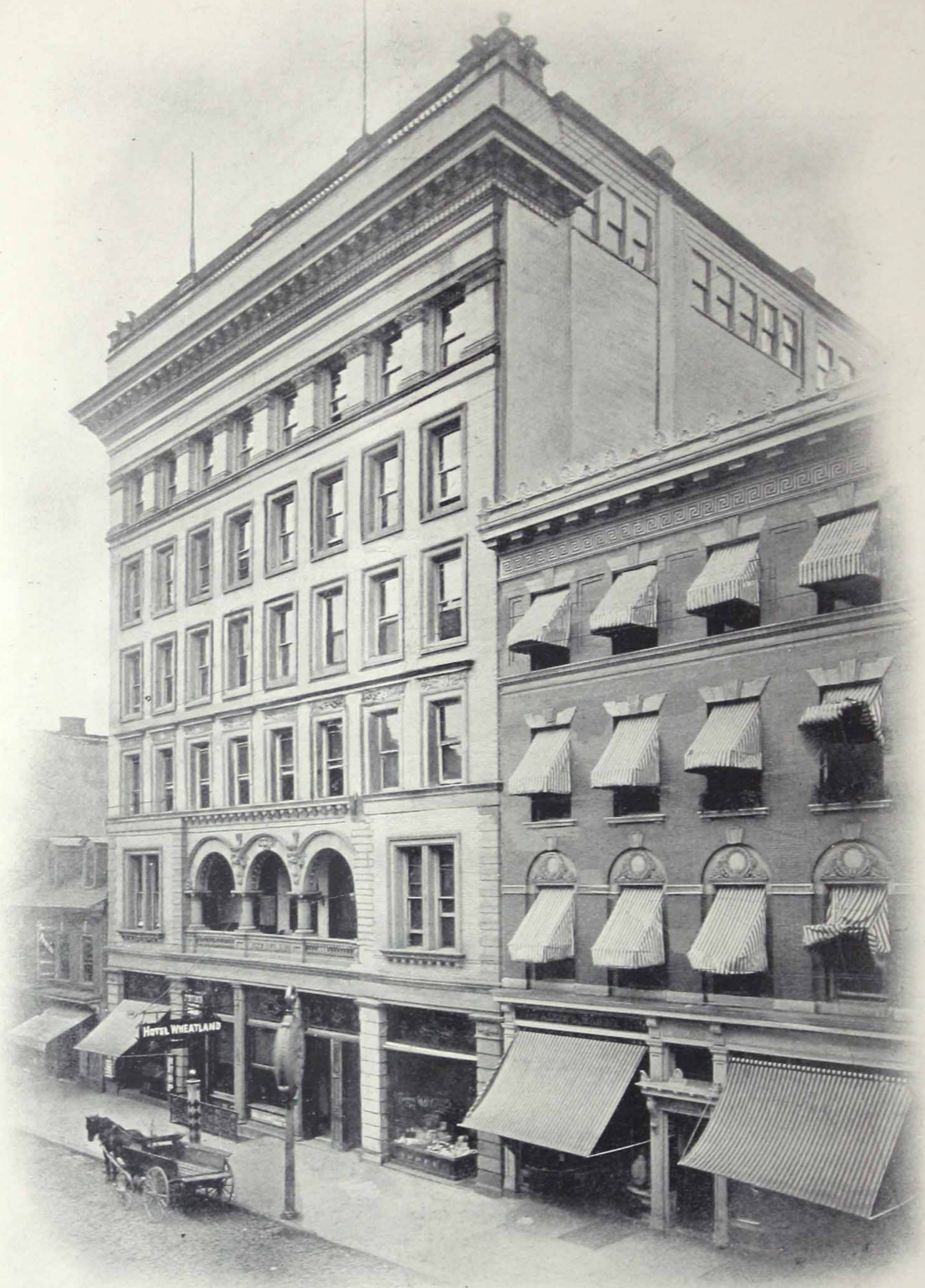


HIGHLAND COURT, HARTFORD, CONN.

Bayley & Goodrich, Architects.  
Hartford Heating Co., Heating Contractors.

but water  
14000  
\$12300  
Vapor  
11000  
119500

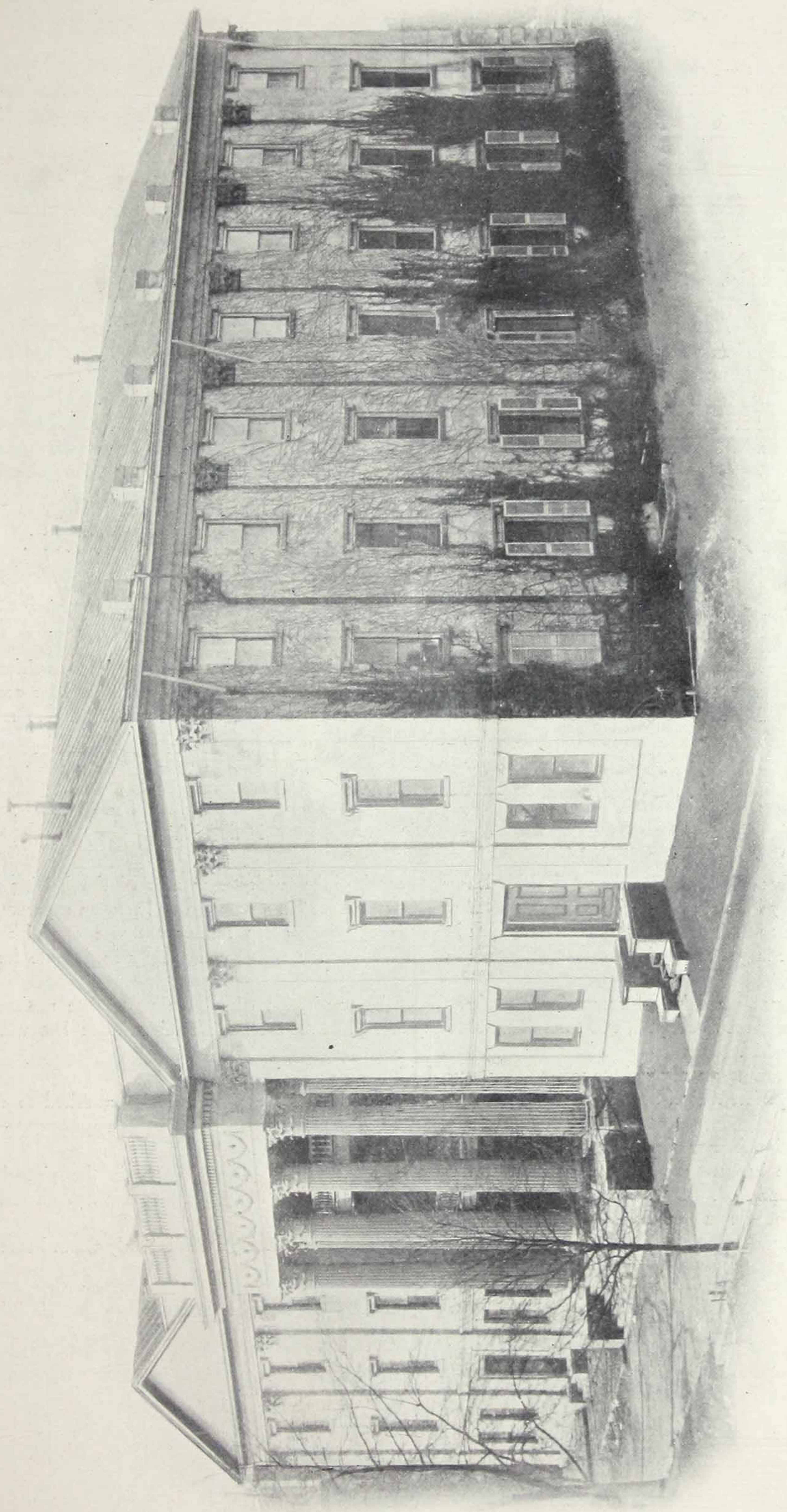




HOTEL WHEATLAND, LANCASTER, PA.

D. M. Rothenberger, Architect.  
W. P. Cummins, Heating Contractor.





ACADEMIC BUILDING, UNIVERSITY OF GEORGIA, ATHENS, GA.

Dornblatt Plumbing Co., Heating Contractors.



CENTENARY M. E. CHURCH,

Philadelphia, Pa.

Vapor Heating Company,  
Philadelphia, Pa.

Gentlemen:—Yours of July 1st received and we are glad to say the Vapor Heating System has proven entirely satisfactory. Our church is large, *much glass* and yet in the *coldest days* the Vapor System gives us all the desired heat and is easy to run, and we cheerfully recommend it. The coal consumption is very satisfactory.

Very truly yours,

JOSEPH A. HUDSON,  
*Chairman Committee.*

1107 Walnut Street,  
Philadelphia.

Vapor Heating Co.,  
917 Arch Street, Philadelphia.

Dear Sirs:—Answering your inquiry, I have pleasure to state that the apparatus and heating plant installed in the building of the School of Design for Women, Philadelphia, by your company has proven efficient and satisfactory.

The building was comfortably heated throughout during the continuous cold of last winter. The apparatus supplants eight hot air furnaces, which formerly were used to heat the building, by a pair of twin boilers, and the building is now uniformly heated, which it was not before. We look for considerable reduction in quantity of coal that was previously used. The coming winter will give us the opportunity for a more favorable comparison than we have yet had.

Yours very truly,

(Signed) JAMES H. WINDRIM.

Vapor Heating Co.,  
Philadelphia.

Binghamton, N. Y.

Gents:—The Vapor Heating plant you installed November, 1900, in my hotel is in every way satisfactory, and the consume of coal very small for the amount of radiation, and you have certainly fulfilled your contract to my entire satisfaction. I believe it to be the best heating plant up to date, and you may refer to me for reference.

Yours truly,

(Signed) L. E. WAGENER.

Vapor Heating Co.,  
917 Arch Street, Philadelphia.

Philadelphia.

Dear Sirs:—It affords me a great deal of pleasure to speak of the satisfactory results of the heating plant installed in my house last fall. The house situated on the park front has a northern and western exposure, has 31 windows, and large open reception halls. The heating problem you can readily see was one of serious import. The large Novelty hot air furnace installed when the house was built was wholly inadequate for the purpose.

The advantages claimed for your System, after thorough investigation of all the up-to-date methods of heating, induced me to adopt it, and I am thankful to say that I had the most comfortable house last winter I have ever lived in.

The following are some of the many advantages, I think, over all other systems:

1. A perfect control of the temperature in any part of the house by a simple device attached to every radiator.
2. Entire absence of noises in the pipes, such as hissing, rumbling, etc.
3. The impossibility of freezing, leakage or bursting, rendered so by the pressure in the pipes being reduced to almost nil. On the coldest day when the boiler was at its best the pressure in the System did not exceed two ounces at any time.
4. Even distribution of heat throughout the house night and day, insuring a continuously warm house.
5. A slightly moist heat permeates the whole house.
6. Absolute cleanliness.
7. Simplicity of construction and ease of handling—far less troublesome than ordinary hot air furnace opening to its automatic attachments.

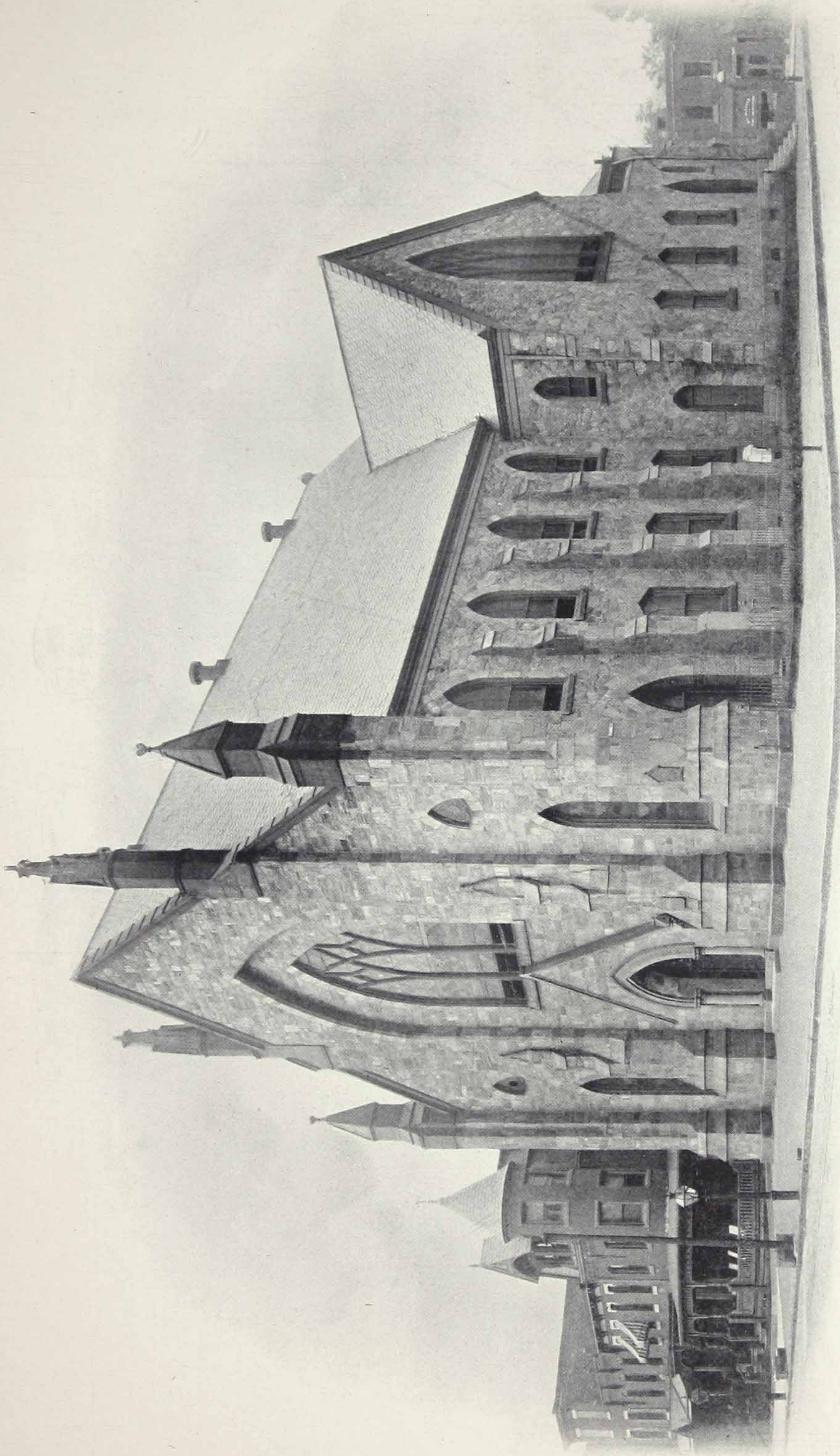
Indeed, I am justified in rendering the highest praise to the Vapor Heating people for the success of their System in meeting a deep felt want in affording a most healthful and efficient means of rendering home comfortable in the coldest and most unseasonable weather.

Truly yours,

(Signed) E. F. BISCOE, M. D.

VAPOR HEATING COMPANY, PHILADELPHIA.





CENTENARY M. E. CHURCH, PHILADELPHIA.

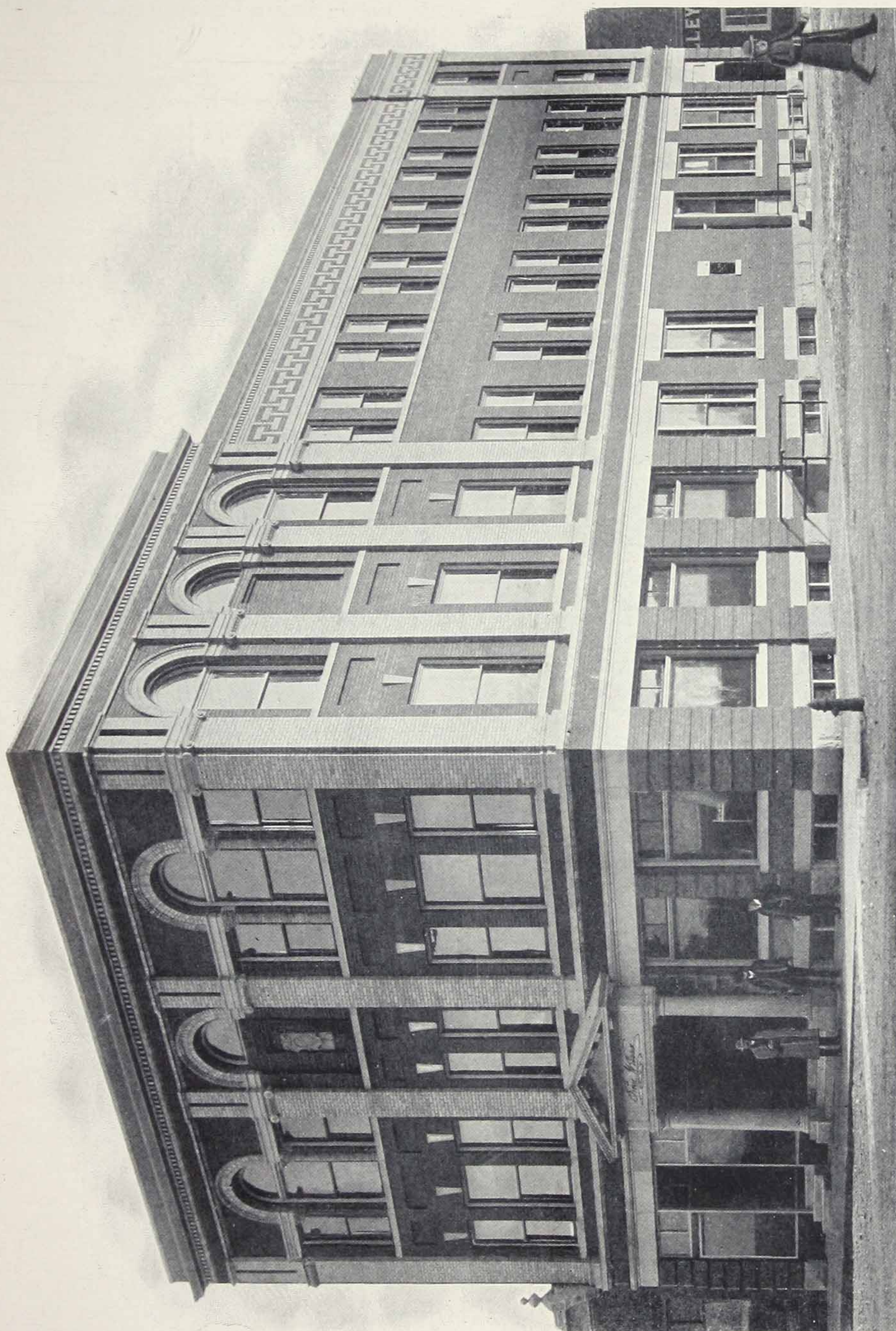
J. C. F. Trachsel, Heating Contractor.



## Some Architects we have Installed Heating Plants for.

BALLINGER & PERROT, 12th and Chestnut Streets, Philadelphia.  
C. C. ZANTZINGER, 251 South 4th Street, Philadelphia.  
WALTER SMEDLEY, Stephen Girard Building, Philadelphia.  
C. E. SCHERMERHORN, 430 Walnut Street, Philadelphia.  
C. E. OELSCHLAGER, Harrison Building, Philadelphia.  
BAKER & DALLETT, 1420 Chestnut Street, Philadelphia.  
WATSON, HUCKEL & CO., 1211 Walnut Street, Philadelphia.  
DUHRING, OKIE & ZIGLER, Penn Square Building, Philadelphia.  
JAMES H. WINDRIM, 1107 Walnut Street, Philadelphia.  
F. H. GUGERT, Wayne, Pa.  
F. L. OLDS, Coal Exchange Building, Wilkes Barre, Pa.  
RUHE & LANGE, Allentown, Pa.  
M. I. KAST, Harrisburg, Pa.  
WYATT & NOLTING, Baltimore, Md.  
JOS. EVANS SPERRY, Baltimore, Md.  
A. O. VON HERBULIS, Washington, D. C.  
BAYLEY & GOODRICH, Hartford, Conn.  
GEO. H. CLEMENCE, Worcester, Mass.  
CHAS. W. LEAVITT, Jr., 15 Cortlandt Street, New York.  
JOHN E. KERBY, 452 Fifth Avenue, New York.  
S. EDSON GAGE, Union Square, New York.  
WM. E. & F. S. STONE, 55 Broadway, New York.  
BUDD, EMERY & EMERY, Bible House, New York.  
CASS. GILBERT, 79 Wall Street, New York.  
FRANK E. WALLIS, 1123 Broadway, New York.  
CARRERE & HASTINGS, New York.  
B. STANLEY SIMMONS, Warder Building, Washington, D. C.  
E. C. SEIZ, Atlanta, Ga.  
WM. E. DONOVAN, Great Falls, Montana.  
LIEBLE, NOURSE & RASMUSSEN, Des Moines, Ia.  
DIEMAN & FISKE, Cedar Rapids, Ia.  
HARRY E. FORNEY, Wheeling, W. Va.  
GALBRAITH & HALS, Spokane, Wash.





WIBAUX BUILDING, MILES CITY, MONT.

John Sturrock, Heating Contractor.



## Heating Contractors who have installed the Broomell Vapor System.

- |   |  |
|---|--|
| George W. Hartman Heating Co., Philadelphia, Pa.  | A. A. Sanborn, Boston, Mass.                       |
| J. W. Cuff & Co., Philadelphia, Pa.               | Worrell, Shinn & Co., Princeton, N. J.             |
| John C. F. Trachsel, Philadelphia, Pa.            | Walter A. Lawson, Newark, N. J.                    |
| Kriebel & Co., Philadelphia, Pa.                  | John R. Croot, Summit, N. J.                       |
| John Borden & Bro., Philadelphia, Pa.             | Banta-Owen Plumbing Co., Ridgewood, N. J.          |
| Harry F. Murphy & Co., Philadelphia, Pa.          | J. S. Burd & Co., Pennington, N. J.                |
| Andrew C. Edgar, Philadelphia, Pa.                | T. J. Jarman & Son, Atlantic City, N. J.           |
| George F. Motter & Sons, York, Pa.                | Finnegan Bros., Bramwell, W. Va.                   |
| York Engineering Co., York, Pa.                   | Warnick & Martin, Parkersburg, W. Va.              |
| Blum & Eyster, York, Pa.                          | L. A. McGuigan, Davis, W. Va.                      |
| C. Ed. Hantz, York, Pa.                           | J. M. Schaub Co., Moundsville, W. Va.              |
| James Bros., West Chester, Pa.                    | A. J. Kennard, Roanoke, Va.                        |
| Apple Plumbing & Heating Co., West Chester, Pa.   | W. P. Longworth & Co., Richmond, Va.               |
| Peter Forve, Wilkesbarre, Pa.                     | George W. Taylor, Smyrna, Del.                     |
| Turner & Van Scoy, Wilkesbarre, Pa.               | Davis Bros., Middletown, Del.                      |
| W. P. Cummings, Lancaster, Pa.                    | D. F. Shaw Co., Wilmington, Del.                   |
| Adams & Cline, Waynesboro, Pa.                    | Brison Heating & Plumbing Co., Wilmington, Del.    |
| Gibson Bros., Homestead, Pa.                      | William H. Heine, Wilmington, Del.                 |
| Brenholts Bros., Ambridge, Pa.                    | Charles A. Howard, Annapolis, Md.                  |
| Shick & Hausman, Catasqua, Pa.                    | Moser Heating Co., Hagerstown, Md.                 |
| George T. Sellers, Gap, Pa.                       | William E. Wood Co., Baltimore, Md.                |
| James D. Scott, Coatesville, Pa.                  | J. H. Brinck, Cincinnati, Ohio.                    |
| John H. Buohl, Mt. Joy, Pa.                       | McDermott & Clemens, Dayton, Ohio.                 |
| McGinness, Smith Co., Pittsburg, Pa.              | Englehart & Hitchcock, Atlanta, Ga.                |
| Snively Heating Co., Pittsburg, Pa.               | Cyrus B. Rees, Washington, D. C.                   |
| M. G. Hale, Shippensburg, Pa.                     | Gambrell Hardware Co., Greenwood, S. C.            |
| Wayne Electric Light & Steam Heat Co., Wayne, Pa. | John Sturrock, Helena, Mont.                       |
| Seligman & Co., Tamaqua, Pa.                      | Adams Heating & Plumbing Co., Helena, Mont.        |
| Frank G. Kramer, Ambler, Pa.                      | I. Krueger, Butte, Mont.                           |
| S. B. Ardrey & Sons, Bristol, Pa.                 | Theo. A. Harker, Livingstone, Mont.                |
| E. D. Bartholomew, Mauch Chunk, Pa.               | Bozeman Heating & Plumbing Co., Bozeman, Mont.     |
| Charles M. Froelich, Harrisburg, Pa.              | John A. Collins, Great Falls, Mont.                |
| Ellison & Co., New York City, N. Y.               | Swanson & Marco, Havre, Mont.                      |
| John F. Sayward & Co., New York City, N. Y.       | Grunwald, Schroeder & Co., Omaha, Neb.             |
| William J. Olvany, New York City, N. Y.           | Wirth & Winterbottom, Fall City, Neb.              |
| Shapley & Wells, Binghamton, N. Y.                | A. Dussell & Son, Columbus, Neb.                   |
| George R. Wyman & Son, Nyack, N. Y.               | Aug. Lubley, Hartington, Neb.                      |
| John Anderson & Son, Flushing, N. Y.              | Messner & Co., Cedar Rapids, Iowa.                 |
| LeValley McLeod & Co., Elmira, N. Y.              | Edwin Cutler, Des Moines, Iowa.                    |
| A. Burlingame Co., Worcester, Mass.               | J. H. Fenton, Cedar Rapids, Iowa.                  |
| Parker & O'Connor, New Britain, Conn.             | Pekin Water Works Co., Pekin, Ill.                 |
| John K. Allen, Greenwich, Conn.                   | Ward & McMahon, Rock Island, Ill.                  |
| T. P. Terry & Son, Ansonia, Conn.                 | Russell-Vail Engineering Co., Stockton, Cal.       |
| Hartford Heating Co., Hartford, Conn.             | M. Isbister Heating & Plumbing Co., Spokane, Wash. |
| G. E. Haslam & Co., Providence, R. I.             | Griffith Heating & Plumbing Supply Co., " "        |
| Henri Lagasse, Fall River, Mass.                  | Kenchiku Kanamono Shokai, Tokyo, Japan.            |

VAPOR HEATING COMPANY, PHILADELPHIA.